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# Veterinary Medicine

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## Bovine Infectious Abortion a Public Health Menace

ONE of the strangest occurrences in the short history of bacteriology was the failure of bacteriologists over a period of twenty years to recognize identity or at least the very close relationship between Micrococcus melitensis, the organism causing malta fever in man, and the Bacillus abortus, causing abortion in cattle.

In 1887, Bruce discovered the organism of Malta fever and ten years later, Bang discovered the organism that constitutes the principal cause of infectious abortion in cattle. In 1918, Alice C. Evans of the U. S. Public Health Service discovered the very close relationship of these organisms, an observation that has since received wide confirmation by bacteriologists of many nations. As a result the name of the organism has been changed to Brucella abortus.

Malta fever has long been a serious problem for physicians in Mediterranean countries. For many years it was a scourge among British toops in that area. When it was discovered that the disease occurred only among those who drank goat's milk, it was practically eliminated from British troops by prohibiting the use of goat's milk to them.

Malta fever was first recognized in the United States in 1905 by Craig, an army medical officer, who discovered a case in a nurse who had been attending sick soldiers in a hospital in Washington, D. C. Later it was found that the disease is by no means rare in the Southern and particularly in the Southwestern states, the infection always being attributable to the use of goat milk. Thirty-five cases of the disease occurred in Phoenix, Arizona, in 1922.

The question at once arises, Malta fever being prevalent among those who use the milk of infected goats, why is it that it does not occur among users of the milk and butter of cows infected by the same organism, that is suffering from contagious abortion? There are a number of answers. First, the disease does occur to some extent as a result of drinking milk of infected cows. A case due to this source was recognized in the Johns Hopkins Hospital in 1922 and since then cases due to drinking the milk of infected cows have been recognized with increasing frequency in various parts of the country.

Another matter having a bearing on this subject is the fact that in countries where Malta fever has long been known to be endemic, its diagnosis is very difficult on account of its varied manifestations and its remarkably close resemblance to certain other diseases, particularly typhoid fever. Obviously then there was little chance of its recognition in regions where it was not known to exist or

by physicians who had no reason to suspect it. It may be more prevalent as a result of the use of infected cow's milk than is suspected. The large extent to which the milk used in cities is pasteurized may have a bearing on the incidence of this disease. The typhoid rate is notably higher in many country districts than it is in the large cities. The milk consumed in most large cities is pasteurized. In country districts it is rarely pasteurized. Possibly some of the disease diagnosed as typhoid fever is Malta fever. Every large city health department reports a considerable number of typhoid and other ailments where the infection is acquired by its citizens while away on vacations during the summer months. May not some of this be Malta fever acquired from drinking unpasteurized milk while at summer resorts?

But not all of the foregoing answers combined would come anywhere near accounting for the difference in the prevalence of Malta fever among those that use the milk of infected goats and those that use the milk of infected cows. It must be concluded, therefore, that the strain of the organism in goats possesses a higher infectivity for man than the strain in cows. However, the faculty of many infectious diseases of increasing in severity and infectivity at times, makes infectious abortion in cattle, one of the most widespread of diseases, a possible public health menace of large proportions.

The pandemic of influenza in 1918, the epizootic of horse scabies in the A. E. F., the outbreak of cholera that killed 15,000 hogs a day for three and one-half months last summer, and the flare-up of ringworm in army horses in 1926, are the more recent of a long list of reminders of the danger that lies dormant in every quiescent infection. There is no apparent reason to expect a serious outbreak of undulant fever among users of unpasteurized milk from cows harboring abortion infection, nor was there apparent a reason to expect, or is there now known a satisfactory reason to explain last summer's hog cholera outbreak, other than the inherent faculty of infections to do just this. Species of animals and plants, high and low, are constantly undergoing sudden mutation. In Burbank's experience, it occurred in higher plants countless times. It occurred in small pox virus about thirty years ago. Some such mutation is fundamental in our conception of evolution.

Contagious abortion in cattle is exceedingly widespread. It ranks with bovine tuberculosis as a source of economic loss to the live stock industry. If it shall come to be regarded as a public health measure of importance equal to bovine tuberculosis, it will constitute a veterinary problem of the first magnitude. Because of its economic importance at the present time and because of its possible menace to public health, contagious abortion in cattle should receive careful and continuous study by veterinarians that they may be prepared to undertake such responsibilities as may be theirs at no distant date in the control of this disease.

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The vitamin content of cod liver oil varies over wide limits, depending to a great extent upon the condition of the fish from which the livers are taken, the manufacturing process and the storage conditions.

To prepare a wholesome palatable cod liver oil having a high vitamin content it is necessary to use only strictly fresh livers, and these should be cooked within a short time after the fish is caught.

Rated upon its energy producing value as a food, milk is but half as expensive as steak. Three pints of milk supply 930 calories and cost 15 to 30 cents. A pound of sirloin steak supplies 975 calories and costs 35 to 70 cents. This does not take into consideration the mineral and vitamin content of these foods, which is greater in milk.

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# Activities of Army Veterinary Corps

THE report of the Surgeon General of the Army for the fiscal year ending June 30, 1926 contains an interesting and gratifying account of the work of the Veterinary Corps.

The activities of the veterinary service of the army are varied, including forage inspection, milk and dairy inspection, meat and meat product inspection, ante-mortem and post-mortem inspection of animals slaughtered for food, inspection of animals purchased for the army, instruction of army personnel, veterinary R. O. T. C. units and veterinary reserve officers detailed for active training, laboratory service and administrative work in addition of course to the responsibility for the health of an average of 43,451 animals belonging to the army, together with professional service for the horse breeding operations carried on by the army.

Obviously from the report, the authorized number of veterinary officers and veterinary enlisted personnel in the army is insufficient for the most effective performance of the varied duties devolving upon the veterinary service. The Surgeon General asks in the report that the authorized number of veterinary officers be increased from 126, the present number, to 187 the minimum capable of functioning effectively in the veterinary corps. He asks permission to fill the vacancies so created by detailing veterinary reserve officers of junior grade to active service for periods of not more than two years.

Both the morbidity and mortality rate in government animals again showed an increase over the preceding year. These rates being, the former more than one-third higher and the latter nearly double, the record low rate of 1922. The increase is accounted for in part by the advancing age of the great majority of the animals of the army; in part by the purchase of nearly 4,000 horses and mules with the inevitable sickness and loss of unacclimated animals under such conditions, and in part by a serious outbreak of tinea which started at Fort Reno and in spite of control measures, extended to government animals at many widely separated stations all over the country; constituting for many months, the principal cause of admission to sick report.

This serious outbreak of tinea is just another demonstration of the potential danger that infectious ailments constitute. A communicable disease is a constant menace whenever present, in many cases out of all proportion to what its previous history would lead one to expect. The devastation wrought by mange in the A. E. F. is an unforgetable illustration of this. Prior to the World War veterinarians regarded mange in horses lightly. No veterinarian of the present generation will again regard it as being of little consequence. Ringworm in animals has seemed heretofore of little consequence and yet it suddenly and without observable cause flared up and became the most prolific cause of admissions to sick report, accounting for 1121 admissions during the year with an average loss of service of 36 days per case.

The growth of the veterinary reserve during the year was far from satisfactory, the net gain in veterinary officers being 54, making a total of 1041 in the Veterinary Reserve on June 30, 1926, but little more than one third the number desirable.

Commenting on the Reserve, the Surgeon General says:

"It is the patriotic duty of every medical, dental, veterinary and allied professional man to enroll in the Reserve Corps for assignment to such duties as their professional attainments and training in civil life may warrant."

# The Pathogenic Shrew Mouse and Other Fallacies

GENERAL FRED SMITH in his admirable History of Veterinary Literature states that Aristotle in The History of Animals (333 B. C.) described the bite of shrew mouse as being poisonous to horses and followed by boils. If the mouse was pregnant, the boils, following the bite, burst or otherwise they did not.

This observation gave the shrew mouse a bad reputation and for 2000 years thereafter writers on Veterinary subjects incriminated the shrew mouse as the cause of a variety of ailments of animals.

Apsyrtus a Byzantine Greek some hundreds of years later in describing a disease that was probably purpura attributed its cause to the bite of the shrew mouse.

The Roman Vegetius (about 450-500 A. D.) in the first book of the Christian era, devoted entirely to Veterinary Medicine, in discussing the diseases of the ox relates that the bite of the shrew mouse or even its passage over an animal leads to injury and paralysis. The cure consisted in immuring the mouse alive in clay and fastening it about the neck of the ox as a charm.

And so or down through the middle ages; again and again in the veterinary literature there are references to the baneful influence of the bite of a shrew mouse or of its presence; an outstanding example of the tenacity with which an error lives on.

Another absurdity, vomiting in the horse as a symptom of ruptured stomach, described by Apsyrtus, lived to even a later date. Veterinarians of the present day will recall it being taught not longer than two decades ago.

In this connection it might be well to inquire into the accuracy of text book statements as to the incubation period of distemper. The observations of veterinary practitioners so far as they are known to the writer seem to confirm the findings of Doctor Lockhart, published elsewhere in this issue, that the usual incubation period of distemper is about 14 days; the minimum period about 10 days and the maximum about 20 days.

Muller and Glass—Diseases of the Dog, 1926—give the incubation period of distemper as 4 to 7 days. Hutyra and Marek —Special Pathology and Therapeutics of the Diseases of Domestic Animals, 1926—give the period as 2-8 days or even 18 days.

Both texts in this possibly perpetuating an error of a large number of writers on the subject who preceded them.

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Tonsillitis is a comparatively common condition in dogs.

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The 4th molar tooth of the dog does not involve the maxillary sinus.

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The virus of foot and mouth disease is usually resistent to disinfectants.

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Urethral calculi are prone to occur in wethers that are fed beets, mangles and other roots.

The value of live stock destroyed by predatory animals each year has been estimated at $12,000,000.00.

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Sheep and mules are apparently less frequently affected with neoplasms than other species of animals.

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Filarial embryos have been demonstrated in the peripheral blood of approximately 30% of dogs in Northern Argentina by Mazza.—*Trop. Vet. Bul.* Vol. 14-4.

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# Control of Communicable Diseases

AT THE Annual Meeting of the U. S. Public Health Association in October, 1926, a committee composed of distinguished public health authorities were appointed to collect information upon and formulate plans for the control of communicable diseases.

After 10 years of deliberation this committee made a report to the 55th Annual Meeting of the U. S. Public Health Association in October, 1926. The report was adopted and published. It has since been approved officially by the United States Public Health Service; and may be said to be the most authoritative pronouncement on the subject.

Since in the case of actinomycosis, glanders and rabies, veterinarians are exposed in greater measure to the contagion than any others and in the case of anthrax the exposure of veterinarians is considerable, the principles promulgated in this committee report for the control of these diseases is given below.

For the adequate protection of his own health and life from the menace of these three diseases it is essential that every veterinarian be thoroughly familiar with the measures necessary for the control of these diseases.

### Actinomycosis

1. *Infective agent.—Actinomyces bovis.*
2. *Source of infection.*—The nasal and bowel discharges, and the infected material from lesions in human and animal cases of the disease. Uncooked meat from infected animals may serve as a source of infection.
3. *Mode of transmission.*—By contact with the discharges or with articles freshly soiled with the discharges from animal or human cases.
4. *Incubation period.*—Unknown.
5. *Period of communicability.*—As long as open lesions remain, as proved by the presence of the infective agent on microscopic or cultural tests.
6. *Methods of control:*
   (A) The infected individual and his environment—
      1. Recognition of the disease—Clinical symptoms, confirmed by microscopic examination of discharges from the lesions.
      2. Isolation — None, provided the patient is under adequate medical supervision.
      3. Immunization—None.
      4. Quarantine—None.
      5. Concurrent disinfection—Of discharges from lesions and articles soiled therewith.
      6. Terminal disinfection—By thorough cleaning.
   (B) General measures—
      1. Inspection of meat, with condemnation of carcasses, or infected parts of carcasses, of infected animals.
      2. Destruction of known animal sources of infection.

### Anthrax

1. *Infectious agent.*—Anthrax bacillus, *Bacillus anthracis.*
2. *Source of infection.*—Hair, hides, flesh, and feces of infected animals.
3. *Mode of transmission.*—Inoculation as by accidental wound or scratch, inhalation of spores of the infectious agent, and ingestion of insufficiently cooked infected meat.
4. *Incubation period.*—Within seven days.
5. *Period of communicability.*—During the febrile stage of the disease and until lesions have ceased discharging. Infected hair and hides of infected animals may communicate the disease for many months after slaughter of the animal, and after curing of hide, fur, or hair, unless disinfected.
6. *Methods of control:*
   (A) The infected individual and his environment—

1. Recognition of the disease—Clinical symptoms, confirmed by bacteriological examination.
2. Isolation of the infected individual until the lesions have healed.
3. Immunization—None.
4. Quarantine—None.
5. Concurrent disinfection of the discharges from lesions and articles soiled therewith.
6. Terminal disinfection—Thorough cleaning.

(B) General measures—

1. Animals ill with a disease presumably anthrax should be placed immediately in the care of a veterinary surgeon. Proved animal cases of the disease should be killed promptly and the carcasses destroyed, preferably by fire.
2. Isolation of all animals affected with the disease.
3. Immunization of exposed animals under direction of federal or state department of agriculture.
4. Post-mortem examinations should be made only by a veterinary surgeon, or in the presence of one.
5. Milk from an infected animal should not be used during the febrile period.
6. Control and disinfection of effluents and trade wastes and of areas of land polluted by such effluents and wastes from factories or premises, where spore-infected hides or other infected hide and hair products are known to have been worked up into manufactured articles.
7. A physician should be constantly employed by every company handling rawhides, or such companies should operate under the direct supervision of a medical representative of the health department.
8. Every employee handling rawhides, hair, or bristles who has an abrasion of the skin should immediately report to a physician.
9. Special instruction should be given to all employees handling rawhides in regard to the necessity of personal cleanliness.
10. Tanneries and woolen mills should be provided with proper ventilating apparatus so that dust can be promptly removed.
11. Disinfection of hair, wood, and bristles of animals originating in known infected centers before they are used or assorted.
12. The sale of hides from an animal infected with anthrax should be prohibited. A violation of this regulation should be immediately reported to the state commissioner of agriculture, by telegram, stating the time, place, and purchaser to whom the hide was sold. The report should also be sent to the person purchasing the hide. Carcasses should be disposed of under the supervision of the state department of agriculture. The inspection and disinfection of imported hides are under the supervision of the United States Bureau of Animal Industry. In the event that infection is introduced the state agricultural authorities have jurisdiction over infected animals and the local or state health authorities have jurisdiction over infected persons.

## Glanders

1. *Infectious agent.*—Glanders, bacillus, *Pfefferella mallei.*
2. *Source of infection.*—Discharges from open lesions of mucous membranes, or of the skin of human or equine cases of the disease (i. e., pus and mucus from the nose, throat, and bowel discharges from infected man and horse).
3. *Mode of transmission.*—Contact with a case or with articles freshly soiled by discharges from a human or equine case.
4. *Incubation period.*—Unknown.
5. *Period of communicability.*—Until bacilla disappear from discharges or until lesions have healed.
6. *Methods of control:*
   - (A) The infected individual and his environment—
     1. Recognition of the disease—By specific biological reactions, such as the complement fixation test, the mallein test, the agglutination test, or by nonspecific reactions, such as the Straus reaction, if confirmed by culture, or by identification of the *Bacillus mallei*, or by autopsy of doubtful cases.
     2. Isolation — Human case at home or hospital; for infected horses destruction rather than isolation is advised. *Skin contact with the lesions in the living or dead body is to be scrupulously avoided.*
     3. Immunization—None of established value or generally accepted.
     4. Quarantine of all horses in an infected stable until all have been tested by specific reaction, and the removal of infected horses and terminal disinfection of stable have been accomplished.
     5. Concurrent disinfection—Discharges from human cases and articles soiled therewith.
     6. Terminal disinfection — Stables and contents where infected horses are found.
   - (B) General measures—
     1. The abolition of the common drinking trough for horses.
     2. Sanitary supervision of stables and blacksmith shops.
     3. Semiannual testing of all horses by a specific reaction where the disease is common.
     4. Testing of all horses offered for sale where the disease is common.

Note.—In this disease, as in all infectious or communicable diseases from which both animals and humans suffer, cases occurring in animals should be reported to the department of agriculture and human cases should be reported to the department of health, reciprocal notification thereafter to be accomplished through official interdepartment channels.

## Rabies

1. *Infectious agent.*—Unknown.
2. *Source of infection.*—Saliva of infected animals, chiefly dogs.
3. *Mode of transmission.*—Inoculation with saliva of infected animals through abrasion of skin or mucous membrane, almost always by bites or scratches.
4. *Incubation period.*—Usually two to six weeks. May be prolonged to 6 months or even longer.
5. *Period of communicability.*—For 15 days in the dog (not known in man) before the onset of clinical symptoms and throughout the clinical course of the disease.
6. *Methods of control:*
   - (A) The infected individual and his environment—
     1. Recognition of the disease—Clinical symptoms, confirmed by the presence of Negri bodies in the brain of an infected animal, or by animal inoculations with material from the brain of such infected animal.
     2. Isolation—None if patient is under adequate medical su-

pervision, and the immediate attendants are warned of possibility of inoculation by human virus.

3. Immunization—Preventive vaccination after exposure to infection by inoculation.
4. Quarantine—None.
5. Concurrent disinfection of saliva of patient and articles soiled therewith.
6. Terminal disinfection—Thorough cleaning.

(B) General measures—

1. Muzzling of dogs when on public streets, or in places to which the public has access.
2. Detention and examination of dogs suspected of having rabies.
3. Immediate antirabic treatment of people bitten by dogs or by other animals suspected or known to have rabies, unless the animal is proved not to be rabid by subsequent observation or by microscopic examination of the brain and cord.
4. Annual immunization of dogs where the disease is prevalent.

The committee defined some of the terms used in the foregoing as follows:

1. *Carrier.*—A person who, without symptoms of a communicable disease, harbors and disseminates the specific microorganisms.

2. *Contact.*—A "contact" is any person or animal known to have been sufficiently near to an infected person or animal to have been presumably exposed to transfer of infectious material directly, or by articles freshly soiled with such material.

3. *Disinfection.*—By this is meant the destroying of the vitality of pathogenic microorganisms by chemical or physical means.

When the word *concurrent* is used as qualifying disinfection, it indicates the application of disinfection immediately after the discharge of infectious material from the body of an infected person, or after the soiling of articles with such infectious discharges, all personal contacts with such discharges or articles being prevented prior to their disinfection.

When the word *terminal* is used as qualifying disinfection, it indicates the process of rendering the personal clothing and immediate physical environment of the patient free from the possibility of conveying the infection to others, at the time when the patient is no longer a source of infection.

4. *Report of a Disease.*—By report of a disease is meant the notification to the health authorities, and, in the case of communicable disease in animals, to the respective departments of agriculture which have immediate jurisdiction, that a communicable disease exists in a specified person or animal at a given address.

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Trypanblue in one percent solution and 10 to 20 cc. dosage has been successfully used in the treatment of canine piroplasmasis.—*Trop. Vet. Bul.* Vol 14-4.

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It has been suggested that no lesion tubercular reactors may be due to sensatization due to the consumption of dead tubercle bacillus.

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Sarcoptic mange is quite wide spread in the north central states. At least 70% of the swine in some communities are affected with this malady.

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Fluid medicaments can be successfully ministered to fowls by attaching a rubber tube that is slightly larger than the fowl's trachea to the nozzle of a dose syringe.

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The lachrymal duct in fowls is prone to become obstructed as a result of colds and roup. In ordinary cases the duct can be opened by carefully passing a quill through it.

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# A Factor Influencing Spring Vaccination

THE Bureau of Agricultural Economics of the United States Department of Agriculture, as a result of a survey made December 1st, estimates that the number of hogs slaughtered in the year beginning November 1, 1926, will be 1,000,000 smaller than the number slaughtered in the preceding twelve months. The decrease to occur largely in the six months following November 1.

This shortage is due to the hog cholera outbreak of the summer of 1926, which resulted in the loss of 1,500,000 hogs in excess of the losses from this disease in 1925. The number of pigs farrowed in the spring of 1926 was the same as the number the department estimate will be farrowed in the spring of 1927. This estimate is made upon a survey of the sows kept for breeding. The number of pigs farrowed in the fall of 1926 was about 400,000 in excess of the number farrowed in the fall of 1925.

One million hogs represent about 2½ per cent of the number of hogs slaughtered yearly at establishments having official inspection. This decrease should tend to make the price of hogs good and that, together with the lesson of last year, should result in a large amount of spring vaccination this year. In anticipation of a heavy demand for anti-hog cholera serum next spring, the Department is studying plans for the accumulation of a reserve supply of serum.

The forward looking veterinarian will ascertain as early as possible from the swine raisers of his community what his probable requirements for serum will be and arrange with the serum producers for his supply.

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Butter supplies 3,300 calories per pound and fish fats 4,080 calories per pound. Fish fats are very rich in vitamins. Whale fat, however, is not only very poor in vitamins but is destructive to vitamins in other fats when mixed with them.

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Corneal ulcers of dogs when not associated with distemper are usually due to some renal disorder. In other words urinalysis is of considerable value as a means of diagnosis to the canine specialist.

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Practicing veterinarians are being employed rather extensively in tuberculosis eradication in Nebraska. From January 1, 1925 to December 1, 1926, 104 practitioners were paid over $50,000.00 by the state for their service in tuberculosis eradication.

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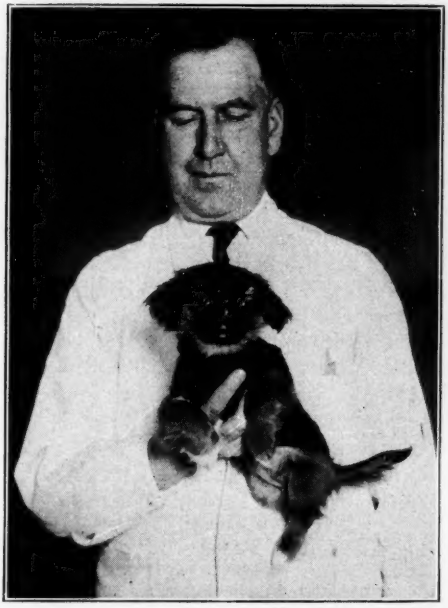
The best grade of cod liver oil has a vitamin content over 100 times as great as fresh dairy butter. With the exception of the fish oils, butter is one of the richest foods in the fat soluble vitamins.



**Dr. Bruce Blair, New York, and one of his patients.**

# Notes on B. A. I. Activities in 1926*

AT THE close of the fiscal year, the bureau rolls contained, 4,045 names, an increase of 66 employes over the preceding year.

The number of accredited veterinary colleges whose graduates are eligible to compete in the civil service examinations for bureau appointments was 13. The number of foreign veterinary colleges accredited by the bureau is 10.

Freshmen enrolled in all accredited veterinary colleges in the United States and the one in Canada numbered 165, an increase of 2 over last year. The number of all students in these colleges was 582, an increase of 8 over last year. The number graduated was 132, a decrease of 11 from the number graduated in 1925.

### Animal Genetics

The guinea pig in-breeding experiment was continued with five in-bred lines as in the past. Two of these lines have reached the 27th generation of brother-sister mating.

### Swine Investigations

Cooperative studies with the Biochemic Division on the effects of treating sucking pigs with hog-cholera virus and protective serum are still in progress. The report for the period of 1921-1925 showed that the 1,715 pigs treated with serum and virus at various ages, between 24 hours and 9 to 10 weeks, suffered no arrest in their normal development. Neither was there a single case of vaccination break or cholera sickness resulting from the simultaneous treatment of 3,187 pigs with serum and virus. Satisfactory immunity was produced in all pigs tested for immunity except those treated during the spring and fall of 1924. The reason for failure to obtain immunity in the pigs treated in 1924 is still under investigation.

*Excerpts from the annual report of John R. Mohler, Chief of the Bureau of Animal Industry of the United States Department of Agriculture, for the fiscal year ending June 30, 1926. The report comprises 43 printed pages. It is all important to veterinarians and may be had upon application to the Chief of the Bureau.

### Sheep Investigations

The limiting factor in sheep production at McNeill, Miss., continues to be largely the problem of internal parasites. By providing as much as 10 acres or more per sheep, frequent changes of pasture, and a monthly medicinal treatment with a solution of 1 per cent copper sulphate and 1 per cent nicotine sulphate, in water, the bureau has been able to raise lambs to breeding age. But in order to raise sheep economically a greater degree of success in controlling internal parasites seems necessary. Plans for solving this fundamental problem are discussed under the work of the Zoological Division. A flock of about 185 experimental ewes and lambs is now on hand at the McNeill station.

### Meat Inspection

Meat inspection was conducted at 913 establishments in 259 cities and towns as compared with 910 establishments in 257 cities and towns for the preceding year.

An ante-mortem inspection was made on 68,245,458 animals, of which 1,403 were condemned and 430,176 suspects tagged.

A postmortem examination was made of 68,289,292 carcasses of which 273,207 were condemned. In addition, 1,108,969 parts of carcasses were condemned.

As cause for condemnation among cattle, tuberculosis led with 71,218 carcasses. As a cause for condemnation of parts of carcasses of cattle, actinomycosis led with the condemnation of 110,318.

Tuberculosis led as cause for condemnation among swine, causing the loss of 63,748 carcasses and 636,707 parts of carcasses.

Pneumonia, peritonitis, enteritis, metritis, pleurisy, etc., led as a cause for condemnation in sheep and horses causing the loss of 5,533 carcasses of the former, and 24 carcasses of the latter animal.

No horses were inspected for human food except for export.

### Eradication of Scabies

In the work of eradicating sheep scabies, which was continued in cooperation with state officials, inspectors in the field made 23,391,576 inspections and supervised 3,176,285 dippings of sheep. On inspection 969,925 sheep were found to be infected. This is approximately 18 per cent less than during the preceding year.

Bureau employes in cooperation with state officials working for the eradication of cattle scabies made 3,269,851 inspections and supervised 1,545,292 dippings. There were 308,787 cattle found on inspection to be infected. This was a slight decrease in the number of inspections but a considerable increase in the number of infected animals and dippings, as compared with the preceding year.

### Eradication of Dourine

The work of eradicating dourine in horses was continued in cooperation with the Office of Indian Affairs and state livestock sanitary officials. In Montana, where no outbreak of the disease has occurred since the fiscal year 1922, a small center of infection was discovered and 17 animals which reacted to the blood test were destroyed. In Arizona, the only other state in which the disease was found, infection was confined entirely to Indian reservations.

### Livestock Sanitary Work in Interstate Commerce

In the course of supervising the interstate transportation of livestock to prevent the spread of animal diseases bureau employes at market centers inspected 21,699,926 cattle, of which 10,875 were dipped under supervision in order that they might continue in interstate commerce. Sheep to the number of 20,128,819 were also inspected for communicable diseases, and of these 821,659 were dipped under bureau supervision to comply with the regulations of the department or of the state at destination. Bureau employes also inspected 36,160,534 hogs and supervised the immunization and disinfection, against hog cholera, of 425,995 swine for feeding and breeding purposes. This was a reduction of 9,654,144 in the number of hogs inspected but an increase of 73,879 in the number immunized. The supply of swine suitable for immunization received at public stockyards was not sufficient to meet the requirements of farmers who desired to feed rather than sell their corn crop because of the greater profit in so doing or because of improvement of their land.

### Inspection and Quarantine of Imported Animals

As in recent years, the number of animals entering the country remained relatively small. This was owing to the existence of serious animal plagues in most foreign countries and the established rule to issue no permits for the importation of domestic ruminants and swine from countries in which foot-and-mouth disease, rinderpest, contagious pleuropneumonia, or surra exists. Cattle entering the country were limited to those from Canada, Mexico, and the Channel Islands.

### Tuberculosis Eradication

An average of 211 regularly employed bureau veterinarians were engaged in the work under the supervision of the inspectors in charge of 44 field offices. The livestock sanitary officials of the respective states employed an average of 267 veterinarians, including a limited number employed by municipalities. In addition, approximately 290 regularly employed veterinary inspectors were engaged by the many counties under the intensive area plan. In all there were 768 veterinarians engaged in the work regularly throughout the year. As in previous years, the county veterinarians showed the most marked increase. The tuberculin test was applied to 774,728 herds, containing 8,650,780 cattle, of which 323,084 cattle, or 3.7 per cent were condemned as diseased.

Figures reported by the field offices show that during the fiscal year 1926 accredited veterinarians under this plan tested 43,921 herds, containing more than 788,995 cattle, an increase over the preceding year.

In connection with the tuberculin testing, a survey was made to ascertain the number of towns and cities in the United States which had municipal ordinances requiring tuberculin testing of cattle furnishing milk

for consumption in their communities. On May 1, 1926, it was ascertained that there were 1,249 such cities (minus records from one state), and that all of these were, with the exception of approximately 1 per cent, being fairly well enforced. This is an indication of the interest of the Nation in securing milk or dairy products from healthy cattle.

Of the cattle reported tested during the year, about 22 per cent were tested by bureau inspectors and about 78 per cent by state, county, municipal and accredited practicing veterinarians.

### Fowl Tuberculosis

The question of fowl tuberculosis continues to be an important phase of the tuberculosis-eradication problem. A survey begun in 1925 and continued during the fiscal year 1926 covered the inspection of approximately 157,950 poultry flocks, containing about 14,000,000 flowls, in 40 States. Approximately 10,000 of these flocks were found to be infected with tuberculosis.

### Regulation of Interstate Movement of Cattle

Most of the tuberculin testing of cattle for interstate movement was done by approved veterinary practitioners, of whom 8,908 are on the list approved by state and Federal officials. These men tested for interstate shipment 29,924 herds, containing approximately 355,836 cattle, of which 0.7 per cent reacted. This is an increase of about 76,000 over the number of cattle tested in the fiscal year 1925. Bureau inspectors tested at public stockyards 72,837 cattle, of which 1,513, or 2 per cent, reacted. Permits were issued for the interstate movement of 82,067 known reactors for immediate slaughter.

### Tuberculosis Yields to Eradication Methods

The very active nation-wide campaign to eradicate tuberculosis from livestock continued with gratifying results. During the year a large increase in county-wide testing of cattle occurred; 109 counties completed tuberculin testing of their cattle with results that permitted the bureau to list them as modified accredited areas. The year's work brings the total of such counties to 198. The large area thus virtually freed of bovine tuberculosis is convincing evidence that the task of eradicating the disease from the entire country is possible of accomplishment. The number of accredited herds also increased greatly.

### Hog Cholera Control

During the year services equivalent to the entire time of 33 veterinarians were rendered the swine industry in 32 States in protecting it against losses from hog cholera.

The quantity of anti-hog-cholera serum produced by licensed establishments was 468,096,257 cubic centimeters, of which 301,303,014 cubic centimeters was ordinary serum and 166,794,243 cubic centimeters clarified serum.

A total of 4,082,608 cubic centimeters of anti-hog-cholera serum was destroyed as unfit for use for the treatment of animals.

### Hog Cholera Investigations

During the year the study of occasional failures of pigs to acquire the desired immunity after immunization against cholera has been continued by immunizing several hundred sucking pigs at six Government-owned farms. The ability to carry out the work simultaneously on different farms in different sections of the country is a great aid to the work, but even so the investigation to be finally conclusive will have to be carried on over a period of years before data can be obtained and principles formulated which will apply throughout the country.

### Roundworms of Swine

The swine-sanitation project for the control of roundworms which was begun in 1919 in McLean County, Ill., was discontinued at that point in 1926 and transferred to Moultrie, Ga. The reason for the transfer was, as in the case of the Vienna sheep project, to meet, in part, the need for an investigation of parasites of southern livestock and to adapt to southern conditions the measures developed in the Corn Belt. The project as developed in Illinois has been surprisingly successful in preventing losses

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of little pigs from worms and associated hog-lot diseases, and has spread widely through the Middle West. It has enabled farmers to raise as many pigs from two sows as they could raise under dirty hog-lot conditions from three, and farmers using the system report that they market 95 per cent of the pigs farrowed. This latter claim has been challenged and possibly does not represent an average, but our figures indicate that individual farmers at least do attain this. The pigs raised make rapid gains, are ready for market four to eight weeks before pigs raised under the more usual conditions, and are larger and more uniform, being marketed without runts or culls for the most part. These gains represent big savings in labor, feed, services, and other items.

### Tests of Anthelmintics

An extensive series of tests was made to ascertain some satisfactory treatment for the removal of tapeworms from poultry, there being considerable demand for this information owing to the lack of knowledge as to a dependable treatment. These tests developed the fact that kamala, a drug long used in India for the removal of tapeworms from man, and also used to remove tapeworms from dogs and other animals, was very effective in removing tapeworms from poultry. Other drugs used as taeniacides for other animals proved failures on tests with chickens, and this has been the usual report by other workers. In doses of one gram to each bird, kamala removed all the tapeworms from the large majority of birds treated.

A dose for turkeys, judged from a small number of tests, is 2 grams. No bad effects were observed in the birds treated even after the administration of 10 grams of kamala to chickens. However, subsequent reports on the use of the drug indicate that, like other anthelmintics, it has certain contraindications for its use, and these will undoubtedly come to light as the drug receives additional study.

Tetrachlorethylene, a drug developed in this division last year for the treatment of hookworm infestations, has been used rather extensively in the treatment of dogs and is now marketed commercially for that purpose. It appears to be especially safe for administration to pups, excelling carbon tetrachlorid in this respect. Preliminary reports of its use for removing worms from foxes are favorable. The drug has been used in a few cases of hookworm disease in man, but the reports are not extensive enough yet to establish its value in comparison with carbon tetrachlorid. A flock of sheep was treated every three weeks for a year, but the results did not indicate that the drug was any improvement over carbon tetrachlorid for use on sheep.

In view of the interest in iodin as an anthelmintic, some preliminary investigations of

iodin and its compounds were carried out. No striking valuable results were obtained, but further investigations are being made. Other investigations have involved tests of tobacco and nicotin for worms in poultry, without developing any new findings. Tests of nicotin and other drugs on sheep were carried out.

Preliminary tests of mercurochrome as an anthelmintic for removing worms from dogs have been carried out and indicate that in

repeated doses this drug is very effective in removing whipworms. The most striking feature of these tests, however, is the fact that the drug, which is also a stain, can be traced through the digestive tract of the host and into the bodies of the worms affected by it. This fact may enable us to ascertain basic facts, now unknown, as to the course of anthelmintics in a host and the method by which they attack and injure worms.

### Flukes as a Cause of Salmon Poisoning of Dogs

During the year investigators at the Oregon Agricultural College and Experiment Station, Corvallis, reported that they had found the cause of so-called salmon poisoning of dogs on the west coast of the United States to be a small fluke occurring in large numbers as adults in the small intestine of the affected dogs and occasionally of foxes, and as encysted metacercariæ in the muscles, kidneys, liver, and gills of salmon and trout (*Oncorhynchus*).

### Nemalodes of Swine

A study of the swine whipworm, *Trichuris suis,* shows no morphological differences between this form and the human whipworm, *T. trichiura,* and indicates that the two forms are identical, a view held by older workers and subsequently abandoned on what appears to have been insufficient evidence. The possibility that man may become infected with whipworms from swine is of considerable interest, and experiments on the transmission of human whipworms to swine are now in progress.

### Rabies

It is desirable to call attention to the extraordinary prevalence of rabies during the year in the territory in which the Bethesda, Md., Experiment station is located. The number of rabid animals dealt with at the station during the year was, in fact, greater than during any previous entire decade. So far as could be learned there are several other regions similarly troubled. It is regrettable that a general, effective muzzling of all dogs that are permitted to run at large can not be enforced.

### Tuberculin and Mallein

The production of tuberculin and mallein for official use by bureau and state inspectors was continued. The total quantity of mallein supplied during the year was 15,285 doses, considerably less than that sent out during the preceding fiscal year. The year's output of tuberculin was as follows: Subcutaneous tuberculin, 628,500 cubic centimeters; intradermic tuberculin, 2,275,152 cubic centimeters; opthalmic tuberculin, 3,804,160 disks. The total production during the year amounted to approximately 15,350,000 doses.

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It has been determined that the minimum lethal dose of salt for chickens weighing 3 to 5 pounds is .4 of one percent of the body weight. Contrary to the opinion of many, a small quantity of salt in the daily ration of fowls is not harmful but, on the other hand, is of some value.

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Veterinarians that have had experience report that from 6 to 8 successive tuberculin tests are necessary to clean extensive tubercular flocks of poultry and that the flock will be reduced at least 50% and in some instances practically all birds are removed.

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The value of an ovarian graft in the stimulation of estrum was demonstrated by Dr. C. A. Schulz of Independence, Mo. The Doctor grafted a three-day-old heifer's ovary into the cervical region of a mature Holstein cow that has not been in estrum for 15 months. Resulting in estrum appearing on the twelfth day.

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Approximately 30% of cows infected with the Brucella abortions eliminate the organism and are therefore spreaders. All reactors should be considered as possible spreaders in any system of control for it is not possible to determine the exact time when a cow becomes a spreader neither is it possible to ascertain when a spreader ceases to eliminate the organism.

# Incubation Period of Dog Distemper

By ASHE LOCKHART, Kansas City, Mo.

THERE is perhaps no phase of canine distemper more generally misunderstood than its incubation period. Various texts place this at from two to fourteen days.

In working with distemper the writer and his associates have observed that the period of incubation and the mode of onset are relatively constant, and to illustrate this a record of several dogs is herewith presented.

These animals varied in age from four to ten months, and all came from farms where it was reasonable to suppose that they had not come in contact with distemper. Only a few dogs were brought in at a time, so the record covers winter, summer, fall and spring. Immediately upon leaving the farm they were placed in direct contact with active cases of distemper and so held until distemper developed, or if it failed to develop in 50 days they were considered as not susceptible.

Thirty-four dogs were handled in this way from August 6th, 1925, to June 11th, 1926. One dog remained entirely healthy throughout the test period, two showed some evidence of distemper, but were not typical cases while 31 developed the disease in typical form.

In observing these and other dogs handled in a similar manner it was observed that the first evidence of the infection is a marked rise of temperature which persists for 24 to 48 hours, the temperature receding to rise again in 96 to 120 hours after the original elevation.

Of the thirty-one typical cases under review three showed the first rise of temperature four days after exposure, five in five days, four in six days, nine in seven days, seven in eight days, two in nine days, one in ten days. It will be noted that 16 of the thirty-one had a rise of temperature on the seventh or eighth day of the test. During the primary rise of temperature, and for several days thereafter there is little visible evidence of sickness. As a rule the dog does not eat normally, and begins to lose in flesh very rapidly. After the second rise of temperature other evidences of distemper make their appearance. These consist of coughing, sneezing, nasal and ocular discharge, and may be followed by various complications.

In the 31 cases under consideration the first visible evidences of distemper (that is, sneezing, coughing, discharges, etc.) were observed as follows:

One on the 9th day
Two on the 10th day
Two on the 11th day
Five on the 12th day
Seven on the 13th day
Seven on the 14th day
Four on the 15th day
One on the 16th day
One on the 17th day
One on the 18th day

It is very interesting to observe that in ten dogs which showed visible symptoms of distemper on or before the 12th day, autopsy revealed heavy parasitic infestation, while two of those that developed on the thirteenth day, and one that developed on the fourteenth showed moderate parasitic infestation. All others were free from parasites, or only slightly infested. This tends to show that parasitism lowers resistance enough to permit distemper to develop more rapidly than normal. It was also observed that temperature curves are less constant in those animals suffering from parasitism.

In a general way it may be said that the complete incubation period of distemper varies from 9 to 18 days, but that in those animals which are entirely healthy at the time of exposure the usual complete incubation period is from 13 to 15 days.

## BOOK REVIEW

Veterinary Medicine and Animal Husbandry is the title of a new German work. The first volume of which has just been received from the publishing house of Urban and Schwarzenberg, Berlin and Vienna.

The work by a number of contributors is edited by Dr. V. Stang of Berlin and Dr. D. Wirth of Vienna. The Editors are professors in the veterinary colleges of their respective cities.

This work is a valuable and welcome addition to veterinary literature. It is of value to the busy practitioner and the specialist alike. It is international in scope bringing together the ablest workers in this field the world over. The extensive references, the fine illustrations, the numerous tables and diagrams and the splendid arrangement of the text all authoritative and embracing the latest discoveries in veterinary science, and animal breeding and management make this a work of vast importance and one well deserving of translation into English.

Houston, Texas. H. J. Magens.

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The number of Veterinary Students enrolled in German Universities in 1926 showed a marked increase over the number enrolled in previous years.

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## NUTRITIONAL ROUP IN SANITARY SURROUNDINGS

I would be pleased to have your diagnosis of a chicken disease that I believe is called "roup" by Dr. Kaupp.

Early symptoms: Leg weakness in baby chicks, sudden deaths in some of the chicks without any apparent cause; conjunctivitis in a good many other cases (zinc sulphate solution failed to cure this trouble); yellow granulated patches in mouth throat and big scabs over one or both eyes. Medicinal treatment proved futile, including chlorazene and calcidin, at least in this particular case. No chicks were kept on this farm for five years. No trouble whatever except hawks. Chicks were fed prepared northern chick feed, ground yellow corn, ground oats, wheat, millet. They were also given green stuff; watermelons, pumpkins, tender young grass, young tender corn, peas, etc. Free range only half the time. Weather was fine.

At the age of four weeks, these chicks, almost as large as partridges, died off at the rate of five or six every twenty-four hours with what is called by Dr. Kaupp, roup. And yet, when the owner got discouraged and gave some very badly diseased chicks away to a neighbor, this neighbor's chickens failed to contract this trouble, though eating, drinking, sleeping with the affected chicks. A few, very few, showed on postmortem, an enlarged gall bladder, maybe the adjoining tissues stained yellow, but most of them did not.

I have not tried vaccination. Have you any experience in that line? Some poultrymen claim its use is doubtful. How soon after the last symptoms of roup have disappeared would it be safe to introduce new stock? In this poultry yard sanitation is carried almost to the extreme. Feeding troughs, drinking vessels, etc., are daily actually burnt out. No external parasites, and in cases dissected, I failed to find any intestinal parasites, though five years ago fully 50 percent of the fryers, broilers, etc., killed for food, showed slight infestation with one or two round worms. The chicks were kept away from drafts.—D. J. Pawletta, Bell, Fla.

Reply by N. W. Ackerman: In considering the problem that has been brought up there are a few things that we should consider that may have a bearing on this condition, viz: has any mash been fed to these chicks or enough protein been added to their feed through sources not mentioned in your letter. Have these chicks been overcrowded in brooding and has the possibility of coccidiosis been eliminated; although in regard to the latter it would be rather unexpected to find it under the conditions reported.

In our opinion, you are very likely contending with a case of what is commonly called nutritional roup. The symptoms tally very closely, beginning with the leg weakness and through to the fact that it is apparently non-contagious. We believe that if these chicks were to be put on a part mash diet and into this be worked about one pint of cod liver oil daily for each 500 chicks

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and then in a few days dropping to one-half that amount the condition would be greatly benefited, also giving them all the milk that they may care for, either sweet or sour; personally we would prefer the sour milk.

In regard to the vaccination for roup, the word doubtful sums up the situation. We have seen and heard of some almost miraculous results from both autogenous and stock vaccines and on the other hand, instances where it is apparently without value, so that rather than lead a client to expect too much, its use has been more or less discouraged, because it is our opinion that when roup breaks out in a flock there is some underlying cause that when corrected will check the trouble; whether it is overcrowding, damp, poorly ventilated houses or some other predisposing factor; and only when corrected will it be safe to introduce new stock.

## ESOPHAGOSTOMIASIS NOT RESPONSIBLE FOR DEATH OF SHEEP

I have a client who lost two sheep last winter, and one just recently. I didn't have an opportunity to see them but he brought in some specimens of the internal organs.

Nothing appeared abnormal excepting the large colon, which was covered on the inside with nodule like bunches about the size of a pea or a little larger. Inside these nodules was a cheesy like substance.

The contents of the small colon was covered with mucous.

The sheep had been sick about three days. They were apparently in good health before that. What ailed them?—S. F. P. Wisc.

Reply: Your description of postmorten findings are in accord with the lesions that characterize esophagostomiasis, a condition resulting from the invasion of the intestinal structure with the larval form of the esophagostoma columbianum. This condition is relatively common but is not usually considered fatal. It is possible that extensive invasion of the intestinal wall by these parasites will diminish the resistance of the affected animal and render them more subject to other diseases. No positive means of successfully eliminating these larval parasites has been devised.

The condition found in the sheep may have been a contributing factor but probably was not the specific cause of the death in the sheep.

## CATTLE TICK ERADICATION

Noteworthy progress in freeing southern territory from cattle ticks is reported by the Department of Agriculture, based on results to December 1, 1926. The report just compiled shows that 737 counties have been released from Federal quarantine against cattle ticks since the systematic eradication work began July 1, 1906. There remain in quarantine 248 counties. In addition, smaller areas, chiefly individual farms, are still quarantined in some counties as a part of a mopping-up program.

The most significant result of tick eradication last year is that of entirely freeing 40 counties of cattle ticks. These counties were in Arkansas, Florida, Georgia, Louisiana, North Carolina, Oklahoma, Texas and Virginia.

Owing to higher prices for cattle and lower values for cotton in areas still infested with cattle ticks and in the South generally, there has developed strong sentiment for active tick eradication programs during 1927. This public attitude is strengthened also by a realization that diversified agriculture, including cattle raising, is desirable in many portions of the South.

Dr. R. A. Ramsay, chief of the Tick Eradication Division of the Bureau of Animal Industry, points out that the continued progress of tick eradication depends largely on public sentiment in the regions affected. The nature of the work requires 100 per cent cooperation among cattle owners and local county and state officials. When all cattle in a community are not dipped regularly some ticks escape, thus delaying completion of the work. The public is now recognizing that ticks must be eradicated before cattle raising and dairying can be made profitable, and this improved sentiment is expected to bring about the freeing of much additional territory of the ticks in 1927.

# A Ramble on Therapeutics

By G. W. BROWNING, V. S., Mobile, Ala.

MYSTERY has no place in therapeutics. If you don't know what a drug does, leave it alone. We no longer cure our patients with drugs alone. Our work is case-management, in which some drug may play a major or minor role. We no longer expect to get some mysterious curative effect from the administration of a drug.

Fitting drugs to symptoms is a forlorn hope of the incompetent. Modern medicine makes, first of all, a diagnosis. When and only when the diagnosis is made a plan of campaign is laid out, which may demand much nursing, careful dieting, stomach lavage and no drugs at all. Or it may demand intensive medication, with little besides. In modern case-management we demand drugs do certain definite things, and we expect just those effects from them and no other. The veterinarian must know disease. If he does he can readily select the drug needed; but he may be intimately acquainted with the whole range of materia medica and still be useless at the side of a sick animal because he does not recognize the signs of septic infection, the sudden incidence of gallstone colic, a failure in cardiac compensation, or does not have the laboratory findings before him.

## Iron

We must eliminate the useless in drug treatment, or be eliminated ourselves.

I will first take up iron, Lloyd's iron, which marks a departure in the development of an old remedy for the treatment of disease. The importance of iron in relation to organic life cannot be overestimated. The longer one studies its action in the human and animal economy, the more he comes to realize that its presence in living tissues, whether vegetable or animal, is of the utmost importance. After thirty-five years' experience in the use of iron as a remedy for disease, I find its field of usefulness practically unlimited. The farther I go into the subject, the more I am astonished at what I discover, and the greater is the incentive to continue the research.

Iron plays an important part in the life of the animal. It constitutes about one third of one per cent. of hemaglobin, and gives color to the blood. Without it the blood could not carry and distribute oxygen to the tissues. The oxygen-carrying power of the blood corresponds to the iron content of the hemaglobin. With a deficiency of iron, the $CO_2$ saturation would be incomplete, muscular contraction could not take place, the vessel walls would lose their contractibility, and blood stasis would result. Without it, then, all the functions of living tissue would cease and death would result. . . . Thus iron is a necessity, both in health and disease.

Iron is deficient in all cases of anemia, in all exhausting diseases, in all congestions, and in all inflammations. From this one may readily see the importance of iron therapeutically.

Organic iron state is present in fruits, vegetables, and the flesh of animals. Under normal conditions, we receive whatever amount of iron we need in our food. Every physician and every veterinarian realizes the importance of hemaglobin of the blood. It is of like importance in the hemaglobin of the muscular fiber. In the blood it regulates the oxygen-carrying power as well as controls the carbon dioxide saturation of the return current. In the muscular structure it governs contraction and relaxation. These functions point the way to its use in medicine.

The beginning of all inflammation is congestion. The blood vessels relax and fill with blood. The vessel walls lose their power to contract, the blood remains in the affected area, and we call it congestion. The relaxation of muscular fiber is due to the absence of the normal stimulus. The power to contract is dependent on the iron content of the muscular fibers. A logical conclusion

is that we furnish the iron to make up the deficiency then contraction will follow, the congested area will clear up, and the threatened inflammation will disappear. This effect I have watched so often that I know whereof I speak. I have seen a congested lung, the first stage of pneumonia in the dog, accompanied by pain, suppressed cough, slight dullness on percussion, a temperature of 106° F. and every symptom of developing pneumonia, clear up in from twenty-four to forty-eight hours, when iron was given early. When iron is so given, what we recognize as the stage of hepatization will seldom follow, and the case will convalesce in the second stage. Nor is this an isolated case. My experience covers a period of thirty-five years' observation and I feel that after a lifetime of study I am competent to speak authoritatively on the subject.

It is not only in inflammation of the lung tissue that iron thus acts. It is applicable to all inflammations, wherever found.

In all grades of exhaustion we find a deficiency of iron. In pneumonia, colitis, laryngitis, pharyngitis, etc., iron is always indicated and should form a part of the treatment. In all infections the body needs the utmost service from the blood. Here the blood cells soon become exhausted, and are incapable of making a fight for the life of the patient. Iron is indicated as one of the needed remedies.

In all cases of anemia, simple or pernicious, the red cells are deficient in the iron content. Here iron must be supplied with our other treatment.

The above explanation, I think, plainly indicates the various uses of this indispensable life agent. The only question that remains is: What form of iron shall we administer?

The answer to this is "Lloyd's Iron." This is a preparation of iron unknown until recently, and it is a form of iron that will mystify and amaze you. Heretofore when we administered iron, we had to take into consideration the strongly acid content of the fluid preparations, or we had to give it, one might say, as iron dust. The acid preparations, such as tincture of chlorid of iron, or Howe's Acid Solution, were objectionable because of their acidity. One could never mix them with a vegetable remedy. To do so was simply to give the patient a quantity of poor ink. If they were given in alternation with the vegetable remedies, we made ink in the stomach. Not so with Lloyd's Iron. If you desire to administer any vegetable agent that may be indicated with this, simply add the iron to your prescription and no black ink follows. If in treating inflammation you desire to administer veratrum, aconite, belladonna, ipecac, or any other vegetable drug in connection with iron, simply add whatever amount of Lloyd's Iron is desired and the solution remains practically unchanged.

The dose of Lloyd's Iron should be small. Be careful not to overdose. Never overload the system with any remedy. Remember, it is needed in the animal system only in very small quantity, but when there is deficiency, however small, there can be no hope of recovery until that little is furnished, either through food or by medicinal doses. Ordinarily for the dog, a few drops to a dram of Lloyd's Iron should be added to four ounces of water, and a teaspoonful of the dilution given every hour or two in acute cases. In chronic cases the interval between the doses should be lengthened.

I should not wish the reader to infer that I use iron alone in treating my cases; but I do use a limited amount of iron added to almost all of my fever prescriptions, and find it pays to do so. For several years past my favorite prescription for pneumonia has read:

℞

Specific Med. veratrum mxx.
Specific Med. bryonia mx.
Iron citrate gr.x.
Aqua qs. ad. ℥iv.
M. Sig. One teaspoonful every two hours.

Today I use Lloyd's Iron in from ten to twenty minims added to the above prescription instead of citrate of iron, and find it makes a more elegant looking mixture, and for a tonic it mixes well with nux vomica, hydrastis, gentian, or any of the bitters. Nevertheless I should not advise giving any

preparation of iron in the same prescription with echinacea, as it makes a nasty mess, especially with all irons except Lloyd's, and even with Lloyd's Iron it is better, where one gives echinacea, to give it alternately with the other prescription that contains iron.

To summarize let me say: Organic iron is one of the most important, if not the most important, remedy for disease in the entire field of drugs. I make this statement, after a lifetime of study and use. Lloyd's Iron might be called "Lloyd's Discovery." It may be used to fortify nearly every agent given for a specific purpose. It is the only preparation of iron that has ever fully satisfied me.

### Nux vomica

This drug is too well known by the profession to need more than a mention of its therapeutic uses. It does make some difference, however, what preparations of this valuable drug we should use, and how we use it. For certain reasons especially in canine and feline practice I have been using the specific medicine nux vomica put up by Lloyd Bros., Cincinnati, for the past thirty years.

What is the best method in which to administer strychnin by the stomach? Should it be given in the form of nux vomica or as strychnin sulphate?

Therapeutically let us start out right. We are now considering nux vomica, not strychnin. Too many write and talk as though nux vomica and strychnin are synonymous. They are not. No one appreciates the worth of strychnin more than I, but I realize that when we are considering specific medicine nux vomica, strychnin is only a part of that preparation. I believe the skilled pharmacist could take specific medicine nux vomica and get from it not only strychnin, but also brucin, and whatever else there may be of value. We use specific medicine nux vomica as a tonic and a stimulant.

It should be noted that the foregoing question referred to administration by the stomach. As an emergency treatment the veterinarian would invariably resort to the hypodermic method and employ strychnin. Upon the condition to be treated would depend whether nux vomica were to be selected or its principal alkaloid.

In atonic conditions of the gastro-intestinal tract, hepatic torpor, sluggish portal circulation, chronic gastritis, in fact in any condition where the keynote is atony or poor innervation, we prefer nux vomica. For these general conditions in the dog the dose should be small, not to exceed one drop.

Strychnin sulphate, given hypodermically or orally, is to be preferred in those cases in which an emergency remedy is needed as in cardiac collapse and shock. It is also to be preferred in nervous and bladder disorders. However my experience with strychnin sulphate as an emergency remedy has been disappointing, particularly in cardiac collapse. So many other remedies act more promptly, such as lobelin sulphate, sodium benzoate, camphor in oil or ether, that we have discarded strychnin in canine practice.

As a general tonic we now use specific medicine nux vomica with the new preparation of iron, and this positively has every tonic we have used in the past eclipsed. In specific medicine nux vomica we figure that we get all the strychnin the patient needs, and with Lloyd's Iron we have a combination that cannot be beaten.

The question may be asked "Why do you prefer specific medicine nux vomica to the United States Pharmacopeia fluid extract?" The answer is, the fluid extract of nux vomica carries the alkaloids, strychnin and brucin in about equal amounts. Specific medicine nux vomica increases the brucin proportion one-half. Therefore we get less of the alkaloid strychnin in the specific medicine nux vomica and more brucin, which makes it much safer in canine practice, besides it is a better tonic than fluid extract or the alkaloid strychnin, and for this reason I like a tablet such as is put up by the Abbott Laboratories, listed on page 7 of their new price list as "Asafetida Brucin and Scutellasoid Compound." This tablet containing 1/120 gr. of brucin sulphate makes a good and safe tonic for the dog and other small animals, while that

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amount of strychnin would be dangerous to weak and emaciated patients.

I have found that the specific medicine nux added to the usual cathartic will enhance its value considerable, in cases where the constipation due to atony, with a very sluggish liver, and in these cases I use the following prescription:

℞

Specific red, Chionanthus ʒiii.
Specific red, Nux vomica Mxxx.
Specific red, Leptandra ʒii.
Syrup simplex qs. ad. ℥vi.
M. Sig. A teaspoonful every three or four hours.

I have but one other comment to make. My own experience with specific medicine nux vomica lasting over twenty-five years, has proved to me conclusively that this is reliable, of uniform strength, and makes a beautiful solution.

### Rhamnus californica

This is a new and non-official drug, not being listed in the U. S. Pharmacopea, although I have used this drug in my canine practice for something over twenty years, for all cases of soreness simulating rheumatism. I find there is nothing that will anything like equal it in relieving the pain and removing the cause at the same time.

Several varieties of rhamnus are employed in medicine. The one used in making specific medicine rhamnus is Rhamnus californica, which is the preparation I use. This should not be confused with the variety Rhamnus purshiana, which is usually listed as cascara sagrada. Still another variety, the Rhamnus frangula of old, is occasionally employed in medicine. From this a fluid extract is made, which is listed as fluid extract of Buckthorn Bark.

Considerable confusion seems to exist among some members of the profession because Rhamnus californica and Rhamnus purshiana, or cascara sagrada. The two differ very much both physically and therapeutically as well as in their habitat.

The only close resemblance between the two is that both are cathartics, acting much the same way. Rhamnus californica is perhaps more drastic, though many patients can take it a long time in rather large doses without realizing any cathartic action. Rhamnus purshiana is more reliable as a cathartic.

Rhamnus purshiana—cascara sagrada—does just what its introducer, Dr. Bundy, claimed for it. It acts as a laxative and possibly as an intestinal tonic. It is separated therapeutically from Rhamnus californica by the one fact, if no other, that it is inert as an antirheumatic. More than this, Rhamnus californica is more drastic in its cathartic action, and when pushed, causes more griping and produces more or less rectal irritation, especially if the patient be subject to hemorrhoids.

The credit of introducing Rhamnus californica to the profession as a remedy for rheumatism belongs to Dr. H. T. Webster of Los Angeles, while that of introducing Rhamnus purshiana belongs to Dr. Bundy of Ohio. Parke, Davis & Company introduced the first pharmaceutical preparation of cascara sagrada in the form of the fluid extract.

Therapeutics: Rhamnus californica relieves myalgic conditions of both the striped and unstriped muscular fiber. It is adaptable to all kinds of pain referable to this condition, whether that commonly regarded as muscular or that involving the internal organs. It thus relieves myalgic pain attending various acute affections, being especially valuable in cardio spasms, angina pectoris, gastralgia, entralgia, vesical pain of spasmodic character, etc. Its greatest triumphs, however, have been found in the treatment of inflammatory rheumatism, where its may often be combined with jaborandi, both remedies being employed in rather full doses, especially in sthenic states. It is not contra-indicated in asthenic cases, though extreme catharsis should be avoided.

I have used the fluid preparation of Rhamnus californica (Lloyd) in my canine practice for the past twenty years, this being the only preparation that I could procure, neither at that time nor at the present time is there a fluid extract made. I have used it in cases of soreness of the muscles, which

we very often have in hunting dogs, after a hard race, in damp cold weather with the very best of success, by virtue of its eliminating properties it relieves the condition by removing the cause. I have used it successfully in cases of gastralgia in puppies where they come to the hospital yelping and lying upon their back with their feet in the air, and show soreness by yelping every time you pick them up. For these conditions I usually add a little colocynth with it.

While I have used this drug in my small animal practice with good results on several occasions, but time and space will not allow me to report these cases at this time. However, I don't feel like letting this opportunity pass without reporting one very interesting case which happened to the writer.

In January of 1920, I was stricken with a very bad case of inflammatory rheumatism which progressed until April. I was entirely incapacitated for carrying on my practice. I first began to the salycilates, thinking it would be of short duration and I would soon be back to work again. However, this was not the case, and I began to seek medical aid from the M. D.'s that were in my city where I was practicing. There were about twenty-three in all and I went from one to the other, until I think they about all had a whack at me. With practically no benefit, in fact I gradually grew worse all the time. Finally, I decided as a last resort to go to Hot Springs, Arkansas, and try and sweat it out, but before going to Hot Springs I mentioned to one of the physicians that was then treating me, that I had used Rhamnus californica for such troubles in my dog practice, and asked him if it would not be a good medicine to use in my case. He laughed and exclaimed: "Do you mean to say you want to use dog medicine for your rheumatism" and warned me that the time for taking medicine for my rheumatism had passed.

By this time my heart was getting very bad. I took his word for it and went to Hot Springs, stayed there three weeks, took 21 baths, which the Doctor said was the required number of baths and during the time I remained there took very little treatment other than the hot baths with the result that when I hobbled on the train to go home, I was in just as bad a condition as before I went. Down hearted and like a drowning man, grasping at straws, decided that just as soon as I reached home, I would commence taking the "dog medicine," as I now had everything to gain and nothing to lose.

I had two four-ounce bottles of Rhamnus californica in the shelf in my office, and began taking it, first in dram doses, every three hours during the day in a teacupful of hot water, with the result that in a week I was so much improved that I began to do a little practice. I kept up this sized dose for about three weeks, when I had so improved that I got back to my old habits, wrestling with bad mules and drenching cows, beside my small animal practice. However, it was about ten months before my heart got in shape that I could do my work like I did before I was stricken with this malady. I continued to take Rhamnus californica periodically for over eighteen months, for fear the trouble might return again, but it hasn't so far, and I believe I can do about as much manual labor as any man of my age that never had rheumatism.

However, I try to take care of myself, which I think everyone should that has once had a bad heart. This was a long time to take medicine but Rhamnus californica has no cumulative effect and can be taken a long time without injury to the system or affecting the heart like the salicylates or mercury. If I had of taken calomel every day for that length of time, would have had enough mercury accumulate in my system to make two or three thermometers.

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In 1500 B. C., cancer was mentioned in the writings of the times.

In 1920, 3400 years later, 90,000 persons in the United States died of cancer.

While Daniel was a captive in Babylon, 520 years before the birth of Christ, Democedes, a Greek physician, cured Atosa, daughter of Darius, King of Persia, of cancer.

FARMERS' JAN 27 '27 LIBRARY



## SPORADIC ABORTION IN THE COW

Authorities reckon that only one per cent. of all bovine abortions is non-infectious. In practice it is a wise precaution to classify all cases of abortion as due to infection. It is not uncommon to find that only one cow of the herd aborts. Circumstances do not permit isolation of the affected animal, and no measures are enforced in order to prevent the disease, if infectious, from spreading. The rest of the herd remains healthy. In such cases, is one justified in assuming that the accident is due to infection? It is granted that, in an outbreak of infectious abortion, only one or two cows might "sling" their calves during the first year. But if there are no aborting cows or only one during the second year, it is unlikely that the single accident of the previous year was due to infection. It seems remarkable that if only an individual cow aborts it is frequently the heaviest milker. We find no clinical evidence that any one of the usually accepted causes of sporadic abortion is operating. Direct injury from kicks, falls, etc., is common in cattle, but abortion as a sequel is rare. Stockfleth and others held that a predisposing cause of abortion is the competition between the uterus and the udder.

"The cow during the period of gestation yields a considerable amount of milk. On the one hand more food is taken in to nourish and develop the fetus; on the other, many constituents leave the body in the form of milk. The milk cow has been bred for generations with a view to produce a great milker, and has about reached in that respect the physiological limit. There exists, as Stockfleth rightly put it, a competition between the uterus and udder. Stockfleth deducts from this that when the latter is victorious the former succumbs and abortion takes place He believes therefore that this physiological relationship ought to be looked upon as a predisposing factor in the frequently occurring abortion of the cow."—(De Bruin's *Bovine Obstetrics.*)

If there is anything in Stockfleth's teaching of more than twenty years ago, an opportunity is at hand to test it. With the advent of cows with an enormous milk yield of two to three thousand gallons a year, one would expect an increase in the number of cases of sporadic abortion. Cows of such a milking capacity are valuable. It follows that their offspring, both male and female, also are valuable. The question arises, do all these 2,000-gallon cows produce a calf each year? If not, then they may be of no greater value than cattle which secrete only three-fourths of that amount of milk but produce a calf annually. Again, granted a calf each year, is the offspring from calfhood to maturity as healthy as that from a dam with a smaller milk yield? We hear of the successes, but what of the failures?

The subject can be examined from another point of view, viz., the dietetic. On many farms the food supply is defective in quality and badly balanced. Frequently the nitrogenous ratio is too low. It is common to find, during winter and spring, that the food consists solely of roots, hay, water and a mouthful of grass.

It might be argued that ordinary food grown on the farm is not likely to be deficient in nutritive materials. All food grown on good land, if well cared for, will not be wanting in its normal constituents. To quote an eminent authority, Sir F. Smith:—"If the land on which a crop is grown be poor in quality, the produce will be in a similar condition; it will be deficient in those constituents on which its nutritive value depends."

Take hay, for example, which certainly is one of the best, if not the best, single foods for milk cows during winter and spring. What do we find? It is no exaggeration to say that on the majority of farms it is cut too late; and it is not always well cured. With a diet of roots and poor quality hay it is unlikely that the excreted salts of calcium, potassium and sodium in the milk will be replaced by the intake of suitable food. The larger the yield of milk the greater will be the amount of those salts excreted by the cow. In the case of the heavy milker, instead of replacing some of the bulky food by concentrated material including one rich in calcium such as bean

meal, the farmer further increases the bulky feed. If that error continues the cow will suffer. Some writers hold that the cow continues to excrete calcium in her milk although those salts are deficient in the food. Surely that mischief cannot continue indefinitely. The cow must suffer. All cows might not suffer alike. Some will show digestive trouble. Who can say that abortion never occurs from dietetic errors—whether a lack of calcium salts, vitamin hunger or what not?—E. McSwiney, M.R.C.V.S., in *The Veterinary Record.*

## RUPTURE OF THE RECTUM IN A PONY

*Subject.*—An aged Welsh mountain pony mare, used for the conveyance of the necessities of life on its back in a steep locality, where vehicular traffic is impossible.

*History.*—The pony had been turned out on the moor for three days the previous week in order to be mated with one of the entires which run wild with the herd.

*Condition on Examination.*—July 20th, 1923, temperature 104°; pulse 65; Conjunctivæ very injected; had passed no feces for three days; difficulty in micturition; no desire for food and drink; and general dejected appearance. There had been occasional signs of slight abdominal pains. Examination of the rectum was made with some difficulty, owing to the small size of the patient. It was found to contain about two stable-bucketsful of feces, which I removed. The rectum was "ballooned" and paralyzed owing to the continued accumulation of the fæces. On the right side the mucous lining and part of the muscular wall were ruptured a length of several inches. It was evidently a case of mis-service—the penis entering the rectum.

We administered an enema, and left the syphon with the owner, who was instructed to repeat the enemata until, and later, they produced a free motion of the bowels. No other treatment was adopted, and the pony was reported to me to appear well again in eight days, and has remained in normal health since.

Cases of mis-service are not uncommon amongst moor ponies, and it is amazing how recovery takes place under the above simple treatment if the serous coat remains intact.

The same applies to a degree in cases of prolapse of the rectum in horses. The chances of recovery depend, not so much on the size of the tumour, but on whether or not the meso-rectal and peri-rectal peritoneum are intact. Rupture of either or both of these implies the cutting off of the blood supply to the prolapsed portion, with serious results.—L. W. Wynn Lloyd, M.R.C.V.S., in *The Veterinary Record.*

## DYSTOKIA DUE TO FIBROMA

A Shorthorn cow, in second calf, which the owner and a friend had failed to deliver, was, on examination found to have a big tumour in the vagina. It was so large that it was impossible to deliver the calf. The tumour was attached to the roof of the vagina by a very narrow neck, and, after tying it as tight as possible with thick silk, I cut it open with a knife.

The growth came out with hardly any dissection with the fingers and it weighed six pounds. The cow has quite recovered.

Under the microscope it was, as expected, a fibroma, and the only reason I had in reporting it was that I had never seen a tumour in this position one-third the size of that under notice.—G. J. Roberts, F.R.C.V.S., in *The Veterinary Record.*

## MILK STANDARD ADOPTED

One hundred cities have adopted the tentative standard milk ordinance developed by the Public Health Service. In actual operation this ordinance has proved to be very capable of enforcement, has measurably improved the sanitary quality of the milk, and at the same time the amount of milk used has increased.

Ear ticks can be destroyed in the ear by injecting a mixture containing two parts by volume of pine tar and one part by volume of cotton seed oil. This mixture is rather thick and it may be necessary to warm it before injection. One injection every 60 days will suffice to keep these parasites reduced to a minimum.

JAN 27 '27

# Subacute Obstructions in the Horse*

By P. L. Cady, Arlington, Nebr.

THIS is an old and ever present condition with which the practitioner has to contend. The word subacute is used purposely to exclude such acute occlusions of the bowels as twists, strangulated hernia, intussusception, etc. That being done, we are brought to a consideration of such disorders as are brought about by any circumstance that causes a stationary or torpid condition of the bowels or a surcharge of the intestinal tract with bulky indigestible foods. This condition occurs most frequently in practice and is commonly known as impaction or stoppage of the bowels.

The causes of this condition are many and varied, especially the predisposing causes, such as the small size of the stomach, the great length and distribution of the intestine together with the enormous loads they are called upon to carry and the natural bars to vomition; the matter of age, the condition of the teeth, the character of food, etc. There may or may not be, but generally is history of over-feeding to cause the overcharging of the horse's intestines which give rise to impaction or stoppage and fecal accumulations.

Now that we thoroughly understand the conditions we have in hand for discussion, the first act of importance is to be sure of our diagnosis.

Upon this phase of the subject I will devote a very limited amount of space, taking into consideration I am talking to a group of men who, by virtue of their training, are amply proficient to successfully differentiate subacute obstruction from other forms of intestinal anomalies causing colic, but just in passing let me suggest the utmost care and thought be exercised in your diagnosis by taking into consideration of:

1. Temperature.
2. Pulse—frequency and character.
3. Respirations—frequency and character.
4. Condition of visible mucus membrane.
5. General expression of the patient—dullness, anxiety, sweating, peristalsis, etc.

Once the diagnosis is definitely established, treatment and subsequent handling must be instituted. The custom employed of giving the one old treatment of aloes and gelsemium or aloes and cannabis or aloes and chloral or aloes and whatever sedative that may best suit the practitioner's fancy, should be condemned severely as a routine treatment. Before instituting treatment, let us ask ourselves these questions: First, what part of the animal system is it best to operate through—the digestive or nervous? Second, or should we directly attack the offending substance itself? I believe that the treatment of the nervous system should receive our undivided attention and I also believe the administration of drugs that act wholly or mainly upon the digestive tract and not on the nervous system are unproductive of good, if not actually harmful. Remember, we can not depend upon the physiological action of such a drug to be sure to ensue. In these cases we are putting a drug in contact with a diseased organ and must not expect that organ to take up, assimilate and respond to that drug, as the same organ would in health. In this case, the disease of the organ is atony, spasm, or paralysis. Relieve that and the bowels will relieve their impaction themselves.

The objections to aloes are:

1. Length of time for action, six hours or more.
2. Probability of being excreted by kidneys.
3. Always nauseating.
4. Acts chiefly on large intestine and may never get there.
5. It needs to be saponified with bile before its action can be depended upon.

*Read at the annual meeting of the Nebraska Veterinary Medical Association, Lincoln, Nebr., Dec. 14-15, 1926.

6. Danger of superpurgation, enteritis, laminitis and death.

We prefer the stimulative treatment and in a modified way follow the plan as closely as consistent as outlined by Coulton Reeks in his "Common Colics of Horse." In fact I very rarely give an aloetic ball to an impacted horse and on several occasions where this was done I have had reasons to regret it very much. I rarely employ an anodyne of any nature and whenever I do it is lobelin sulphate ¼ to ½ grain hypodermically or in extreme cases chloral hydrate in solution—through the stomach tube. My favorite treatment in these cases, as mentioned before, is a stimulative treatment as suggested by Reekes, only added to and benefitted thereby I think by the addition of salicylic acid as indicated in the following prescriptions:

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| | | |
|---|---|---|
| Ammon. Carb. | | |
| Pulv. Nuc. Vom. | aa | ℥ ii |
| Ac. Salicylic. | | ℥ i |

M. et F. Caps. No. 8.

Sig. Two to four capsules depending on size or conditions.

℞

| | | |
|---|---|---|
| Ol. Terebinth. | | |
| Ammon. Arom. | aa | ℥ ii |
| Ol. Lin. qs | | O i |

M.

Sig. Give as one dose three hours after the foregoing if necessary.

In this connection I generally give hyperdermatically one grain of eserin and two grains of pilocarpin preferring this to arecolin. Results are what count with me and in my hands arecolin has not produced them like eserin and pilocarpin.

Although very much might be written on this subject I feel I have already made this sufficiently lengthy to promote a good discussion. My main object has been to point out what I believe to be a dangerous though common practice in administering aloes and sedatives to the horse suffering from subacute intestinal obstruction. If I have succeeded in convincing some of the young practitioners that this is the logical course to pursue then my efforts have not been in vain. And if I have not then I will say I have failed in a good cause and my presentation of the subject is not in keeping with the results attending the treatment as outlined.

## HERNIA IN SWINE TRANSMISSIBLE

Cryptorchidism and herination are common transmissible defects of swine that should be taken into consideration in the selection of breeding swine. Chief Tecumseh II was a famous boar in Missouri, but about 5 percent of his progeny were cryptorchids and this defect occurred in about the same proportion in the third generation. Cryptorchidism in swine according to B. S. Warwick of the Wisconsin Agricultural Experiment station, is an important economic problem because approximately one percent of male swine on farms are cryptorchids, and are not castrated excepting in those herds in which a veterinarian does the work.

Warwick has recently reported a series of breeding experiments of herniated swine in which the parent stock included only herniated boars and the sows selected were, so far as possible, related to herniated boars. The result of this breeding experiment was: 14.28 percent of the first generation of male pigs were herniated, 42 percent of the second generation, and 43.18 percent of the third generation.

## TREATMENT FOR CHRONIC NASAL CATARRH

After numerous applications of the remedy, in all over 30 cases, excellent results were obtained in practically all cases of chronic nasal catarrh by the administration of mallein 2½ c. c. hypodermically. Rarely was it necessary to apply more than one dose, using the horse daily and with no adjuvant treatment.

These cases have usually proved very obstinate, the treatment time consuming, and usually unsatisfactory. The mallein treatment simplifies and gives results not obtained by the usual remedies. Occasionally it will be necessary to repeat the dose in thirty days.

Geo. L. Warner, D. V. S.
New York, N Y.

# Pigs in India

**Despised by All—Cash With Order—Hog-Hunting Encouraged**

By CAPTAIN GEORGE CECIL, Paris, France

### The Marauder's Fate

IN India the pig is of little account. Considered an unclean feeder, it ranks even lower than the ignoble pariah dog. The lowest caste native declines to eat pork, while the sahib-log (white people) will not, under any circumstances, touch the flesh of the despised animal; imported bacon alone satisfying their needs. So poor, in fact, is the Indians' opinion of the pig that "O' pig!" is their favorite epithet, varied by "Pig and son of a pig!" Hasty Europeans, rendered irascible by the excessively trying "hot weather" months, and by the no less detestable mugginess which follows each shower of rain, also use the expression; the words "soor ka butcha" often rising to their lips. Trouble, however, may follow, the native particularly resenting this vernacular abuse from the bacon-eating conquerors. An official who, in the heat of the moment, thus expresses himself may find his promotion retarded. Promising careers have been nipped in the bud.

**A meet of hounds at Lucknow. Mahomet Din was in veterinary charge of this pack. He admitted that he was the best dog doctor in India and added the information that the dog doctors in Simla, Calcutta and Bombay were no good. My contract with him called for at least one call every day and as many additional calls at might be necessary. The stipend was one rupee (about 32 cents) per week.—G.C.**

Meanwhile, the pig exists on sufferance, though several wander about every large village, as well as in the hamlets, it being their business in life to eat the banana skins, water-melon and mango husks and other refuse. But should the *soor log* extend their activities to the crops, they are ruthlessly knocked on the head with brass-bound clubs. Marauding is strictly prohibited.

### A Demand for Pigskin

If the pig is held in no respect by those who study the pleasures of the table, it at least is turned to commercial account, for a

vast number of skins find their way to the various tanneries, the leather subsequently being supplied to saddlers, harness-makers, native shoemakers and cobblers—of whom there are many. The last-named usually club together, the senior *mochi* in the place sending the order to the merchant and apportioning the leather. He also sees to the despatching of the postal order, which accompanies the *indent*. Without this formality the goods would not be delivered; cash transactions alone are encouraged, much to the annoyance of the customers. No doubt the tanner is the best judge of what is necessary. In a country of sudden death from cholera, snake-bite, plague and fever credit is dangerous; besides, it is difficult to bring a defaulting creditor to book. So not until the *rupees* are forthcoming is the order executed.

The wild hog is put to a sporting use. The Anglo-Indian armed with a spear, rides him down, and, finally coming to close quarters, delivers the fatal thrust. The beaters sell the skin to the villagers, who, roughly curing their purchase, send it to the nearest tannery, a very trifling sum changing hands.

The Indian domestic pig generally is black or dark grey, as also is the wild hog. The last-named has long hair on the crest and neck, and truly formidable tusks with which to rip up the rider who, unseated by a boar's fierce charge, comes to earth. The *sahib* who escapes with his life may consider himself fortunate, for no animal can do greater mischief than the pig who has felt the prick of the spear-point. He makes short work of his tormentor.

### Native Gratitude

When it is known that a party of white men contemplate "pig-sticking" in the neighborhood, there is much rejoicing in native circles, the villagers, at the conclusion of the morning's sport, often placing garlands around the necks of the *sahib-log*. The wild pig, you must understand, gets into the fields, damages the maize, millet and other crops, and, if disturbed by the enraged proprietor of the land, uses his tusks with deadly effect. Hated, is he by the rural populace, who, in their ignorance, look upon him as the devil in disguise.

The pig, by the way, is a product of the "plains," as the flat parts of India, are called. In the Himalayas the animal is unknown.

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Avian tuberculosis occurred in 6.2 percent of over 150,000 flocks investigated by the Bureau of Animal Industry. There is apparently a larger percentage of avian tuberculosis in flocks in the central northern states than in other sections.

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## RUMINATORIC ACTION OF LOBELIN SULPHATE

Lobelin sulphate appears to exert a stimulant action upon the muscularis of the bovine stomach, particularly the first compartment, or rumen.

Graphic records secured during the course of several experiments performed upon an experimental cow indicate an increased frequency and strength of the peristaltic activity following the subcutaneous injection of one-tenth grain of lobelin sulphate. Two-tenth and three-tenth grain doses are apparently no more effective than the one-tenth grain administration.

Our experimental subject was affected with a purulent pneumonia and the digestive functions were greatly depressed as a result of the general body weakness. This state of depression approximated, to some extent at least, the conditions encountered in the usual case of stasis or impaction of the fore-stomachs of the ruminant.

We wish to suggest the following treatment for impaction of the rumen. Administer generous quantities of water to the patient, either by drenching or by means of the stomach tube. Follow with lobelin sulphate subcutaneously, administering one or more doses at one or two hour intervals. The one administration may be sufficient to produce a proper mixing of the liquids and the solids and restore the food mass to a normal consistency. It appears from the results obtained in the laboratory that the one-tenth grain dose is just as effective, if not more so than the larger administrations.—R. S. Amadon, in *Veterinary Extension Monthly*, U. P.

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# Effects of Mineral Deficiency in the Feed of Cattle*

By **SIR ARNOLD THEILER, K. C. M. G., Dr. Med. Vet., Director of Veterinary Education and Research, Department of Agriculture, Union of South Africa**

UNDER the title of "Phosphorus in the Live Stock Industry" the author in a 47 page bulletin, gives a lucid description of the extreme aphosphorosis (Phosphorus deficiency) that exist among range cattle in many sections of South Africa and the very marked improvement that results from feeding bone meal or wheat bran.

The discussion will interest every American veterinarian not only because of the close similarity of this condition to loin disease of the Rio Grande section, but because of the general information it contains concerning mineral deficiencies in the feed of live stock. The bulletin contains many excellent illustrations and a number of tables showing the results of the various experiments carried out. The following excerpts from this bulletin have a very general application.

Phosphorus is unquestionably a limiting factor in the growth rate of cattle, and a dominating factor in the maintenance of live-weight under ordinary conditions of veld grazing, so that the nutritional aspects of the investigations now altogether overshadow the original problem of disease (lamsiekte). Since the areas over which the nutritional factors apply are far wider than those over which lamsiekte occurs, the annual financial gain to the stock-raising industry in the future can easily be made far to exceed the annual financial losses from lamsiekte in the past. Indeed, by focussing attention upon specific nutritional deficiencies of South African veld, the disease can almost be said to have been "a blessing in disguise."

Increase of milk yield of cows, better calves at birth, more rapid growth of young stock, and superior fattening of adult cattle, all follow simple bone meal feeding, and agricultural propagandists might well carry the phrase "Bone Meal for Beef" as slogan cry over all the phosphorus deficient areas of the Union.

Lamsiekte may be prevented either by cleaning the farm of all carcass debris or by feeding phosphorus compounds to the cattle. Both are recommended; the first on general hygenic grounds, the second for the reason that the cost of feeding bone meal is repaid many times over in the improved condition of the cattle, quite irrespective of the insurance provided against the disease.

The same result can be achieved by phosphatic manuring of the soil, but the cost is prohibitive.

### Styfsiekte

Styfsiekte, another deficiency disease, can quite definitely be prevented by feeding bone meal or other material containing sufficient digestible phosphorus.

Styfsiekte may indeed turn out to be an extreme form of phosphorus deficiency, a real "aphosphorosis;" or a mixed deficiency disease in which low lime as well as low phosphorus plays a part; or there may be an hitherto unsuspected link in its etiological chain.

It occurs on some phosphorus deficient soils, but not on others; is prevalent where lamsiekte is unknown, but absent some places where lamsiekte is prevalent. There is, therefore, an unknown factor, which, however, will not disturb the practical farmer as long as he is satisfied that he can control the disease by bone meal feeding. He can do this easily and effectively and in the process enormously improve the condition of his cattle.

*Reprint No. 18, Government Printing and Stationery. Office, Pretoria, Union of South Africa.

### Osteophagia

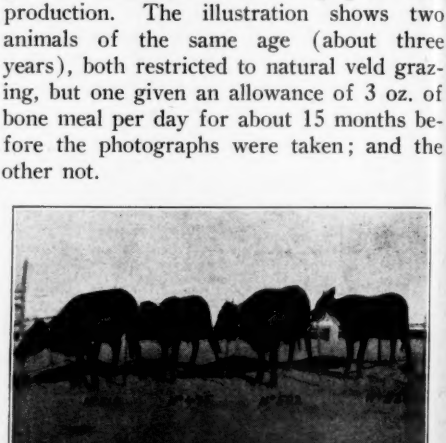
This is the most obvious outward sign or clinical symptom of phosphorus deficiency in cattle; and, although not infallible, is a very valuable indicator of such deficiency in the majority of veld-bred bovines. Curiously enough, it is not shown to the same extent by other animals; is, for instance, only feebly manifested by sheep.

Osteophagia is a specific form of "pica" or "depraved appetite," showing itself as a special predilection for bones. In extreme cases, "osteophagia" may pass over into "allotriophagia," in which specific discrimination is lost and the animal will chew any sort of rubbish at all. In its milder forms, the abnormal appetite is quite finely adjusted, and only the best sun-bleached bones are eaten. In its more aggravated forms, any putrefying bones may be eaten, and it is not an uncommon sight to see "extreme cravers" crowding round the rotten carcass of a dead animal.

Owing to the nice discrimination displayed in typical osteophagia, it is possible to sort out a herd, for experimental purposes, into "marked cravers," "slight cravers," and "non-cravers." This is simply done by first offering sterilized "rotten bones," i.e., bones still possessing a putrid odor. The animals which will chew such bones are entered up as showing "marked osteophagia." The remainder of the batch are then driven out to another corner of the "testing kraal" and allowed access to "sweet bones"; i.e., bones which have been well bleached in the sun and which no longer possess a putrid odor. Any animals which will chew such bones are entered up as showing "mild osteophagia"; and the remainder, displaying no predilection for bones at all, recorded as showing "no osteophagia."

### Live-weight, Condition and Growth

The osteophagia just discussed would represent little more than an interesting curiosity to the farmer, but for the fact that it is the precursor of disease and the index of defective nutrition in his cattle. Indeed, the South African farmer has not only known "pica" all his life, but has treated it as normal. Many farmers still disregard its significance, and it is one of the express objectives of this present paper to convince them that osteophagia means not only danger of disease, but consistently poor beef production. The illustration shows two animals of the same age (about three years), both restricted to natural veld grazing, but one given an allowance of 3 oz. of bone meal per day for about 15 months before the photographs were taken; and the other not.



**Showing the influence of phosphorus on growth of cattle, otherwise restricted to natural grazing**

| Weight | No. 518 | No. 475 | No. 502 | No. 528 |
|---|---|---|---|---|
| January, 1922 | 310 lb. | 319 lb. | 304 lb. | 297 lb. |
| May, 1923 | 755 lb. | 465 lb. | 726 lb. | 451 lb. |
| Increase | 445 lb. | 146 lb. | 422 lb. | 154 lb. |
| Bone-meal ration | 3 oz. | Nil. | 3 oz. | Nil. |

Calculating on the basis of the initial weight of 300 lb., the actual increases are 60 per cent for the controls, but 105 per cent for the lot receiving the bone meal ration; the latter having more than doubled their weight. The bone meal batch also increased more in size, i.e., in skeletal development, so demonstrating the specific effect upon growth. The pictorial illustration of this shows four animals, not selected because they made a pretty picture, but originally picked out on the basis of similarity in weight, age and appearance over a year before the photograph was taken. The exact experimental protocols are included in the legend to the plate.

It will be noted that No. 518 has increased more than three times as much as No. 475 in sixteen months, although actu-

ally the smaller animal at the commencement. No. 528 is similarly stunted by comparison with No. 502, its phosphorus-fed fellow. Subsequent experience has shown that results nearly as good can be obtained with less bone meal than actually used in this experiment, although a liberal ration is always surer. These animals are representative of the general results of phosphorus feeding, now recorded for hundreds of cattle; more representative than the dramatic differences shown in some other animals, but sufficiently striking to convince any progressive farmer of the need for bone meal feeding on phosphorus deficient soils. Although bone meal is here used as source of phosphorus, wheaten bran or other palatable digestible phosphorus rich supplement serves the same purpose.

Is the amount of phosphorus required to prevent osteophagia the optimum for growth?—When the Armoedsvlakte feeding experiments were commenced, the two functions of bone meal were kept in view: (a) Prevention of lamsiekte by obviation of osteophagia, and (b) improvement in growth and condition by obviation of nutritive de- (1921) an attempt was made to measure the phosphorus requirements of different classes of animals by determining the minimum ficiency of the pasture. Shortly afterwards amount required to prevent osteophagia, and to estimate the phosphorus deficiency of the veld at different seasons of the year by noting the variations in amount of phosphorus required to supplement it, correlating the latter with actual analyses of the vegetation. "Osteophagia equilibrium" experiments were then devised, in which the daily ration of bone meal was varied every week upon the basis of a weekly test for osteophagia. If during any week the craving for bones disappeared, the daily ration of bone meal was dropped slightly. The moment the craving returned, the ration was raised slightly. In this way the cattle were kept just on verge of osteophagia, and the actual amount of bone meal required to maintain this "equilibrium" charted against season (or time) for cows, calves, growing stock, and adult oxen.

It was then found that, although osteophagia is an excellent general guide to phosphorus deficiency, and a certain indication of susceptibility to lamsiekte in presence of the other essential links in the etiological chain of this disease, it is by no means infallible as a measure of the need for phosphorus in nutrition. Although osteophagia nearly always (with the exception of a few "habitual" or "chronic" cravers) indicated nutritional need for phosphorus, quite a number of animals (especially young stock) failed to display osteophagia even when their nutritional need could be readily demonstrated by a dietetic experiment. Furthermore, osteophagia only appeared (in general) at a level of deficiency distinctly below the optimum requirements from the nutritional point of view.

It is apparent that phosphorus requirements are lowest for animals which make demands only for maintenance, but not for growth or reproduction. For this class of stock 6 oz. to 9 oz. of bone meal per week provide sufficient phosphorus to prevent osteophagia, even during the worst period of the year (winter grazing, May to August); while during the period of very young grass practically no bone meal is needed, the proportion of phosphorus in the vegetation itself being then sufficient for mere maintenance.

With young growing stock the requirements are a little higher than for oxen, apparently varying from 2 oz. to 10 oz. per head per week, according to the season of the year, i.e., according to the stage of growth of the grass. Expressed upon the basis of live-weight, the difference "per 1,000 lb." would be even more marked. Growing stock require slightly more bone meal than adult oxen, in spite of the fact that the latter are larger and heavier animals; further, that they require it all the year round.

Coming now to breeding cows, the difference in phosphorus requirements is shown as very much greater, and it is apparent that the main demand for the extra bone meal is for milk production. The first part of the curve shows that the extra demand

for the early period of pregnancy is not great, the amount of bone meal being only about 2 oz. per head per week higher than for oxen. During the last two months of pregnancy, however, the demand increases and at the time of calving is considerably higher than for oxen. Thereafter the requirements for bone meal increase rapidly owing to the combined factors of season and lactation; increasing age of the grass being accompanied by decreasing phosphorus-content; and milk production requiring relatively much phosphorus for the manufacture of casein, a phosphoprotein. In August as much as 28 oz. of bone meal per week are required to prevent osteophagia; an average of four ounces per head, per day.

For optimum growth and condition, the quantities recommended would be distinctly higher and more uniform throughout the year. Each farmer has to be guided by his own experience on his own farm in deciding how much bone meal he can profitably feed, but as a basis upon which to work, the following figures should prove a useful starting point: One oz. per day for calves up to 18 months; 2 oz. to 3 oz. for the remainder of the growing period; back to about half this for old oxen for mere maintenance of good condition; up to 5 oz. for cows with calf at foot. For dairy stock of high milk yield, the owner should cheerfully go up to 8 oz. unless he is using supplementary rations containing wheaten bran; in which case he can reduce his bone meal allowance by about 1 oz. for every 1 lb. of bran he feeds. For such stock, which give an immediate return in milk sold off the farm, he will find that it pays to go on increasing his phosphorus ration until he is satisfied that he is getting the maximum milk yield from cows maintained in good sleek condition. A "staring coat" at least deserves trial on a higher ration. If his cows are kraaled or stalled in such a way as to render collection of manure at all feasible, it should be remembered that a large proportion of the phosphorus goes out in the dung and that this will work wonders with any land he has under cultivation.

### Influence on Milk Yield

That milk production imposes a severe strain upon the phosphorus reserves of an animal is a well-known fact. Indeed, recent American work goes to show that a lactating cow is usually in "negative phosphorus balance," i.e., may lose phosphorus from her own reserves (skeleton) even on an ordinary ration. On the phosphorus deficient veld of Armoedsvlakte the strain is reflected through osteophagia in the manner just discussed. On the Ermelo high veld it is reflected in the same way, but is further demonstrated by the prevalence of "styfsiekte" (stiff-sickness) amongst cows at, or after calving; and by the tendency to recover from that disease if the calf is taken away and the milk flow allowed to dry up. It may, however, be demonstrated directly on the milk yield itself.

Ten ordinary veld cows were selected and milked from alternate halves of the udder on alternate days, leaving the other half for the calf. The data so obtained were doubled for "total yield" and preliminary records kept for a few weeks. They were then divided into two batches of five in such a way that the total yield was approximately the same for both. Both lots were restricted to the ordinary veld grazing, but one was given a ration of bone meal (8 oz. to insure experimental excess) and the other not. The milk yield at once responds to the phosphorus supplied, and the bone meal batch averages about 40 per cent more milk. Low phosphorus is therefore a limiting factor in milk production. The actual milk yields shown, 35 litres per week, or about 5 litres (about 9 pint bottles) a day, dwindling to half this after a few months, are low owing to the nature of the stock; ordinary Afrikander cross-breds giving merely enough to bring up their calves on the veld, and doing even this under adverse conditions of food supply. With dairy stock, the differences would unquestionably be much more striking, when expressed in litres or gallons, and experimental data for the benefit of the dairy farmer are now being acquired. It is practically certain that these experiments will show a very substantial profit upon the

monthly milk bill for every ounce of bone meal fed.

The benefit derived by the sucking calf is an immediate result of feeding bone meal to the mother. A single year's continuous bone meal feeding works wonders with both mother and offspring. Precise statistics in this direction are now being acquired.

### Weight and Vigor of Calf at Birth

Calves born of phosphorus-fed mothers average from 10 to 20 per cent heavier than calves born of controls. They are also stronger, get more milk from their mothers, and so get a better start in life. It is not desired to labor this point, however, since it is one of the wise provisions of nature that during the period of gestation the mother sacrifices herself for her offspring; and many a scarecrow cow throws a fine calf. This is particularly noticeable in the styfsiekte areas, where the mother develops the disease mainly through the sacrifices she makes in nourishing her calf during late gestation and early sucking. The calf usually gets along quite creditably so long as the mother's milk holds out, a real "stunting of growth" becoming manifest only after weaning, when it has itself to rely upon the veld grass on which its mother bred it. Nevertheless, in spite of the capacity for maternal sacrifice, removal of phosphorus deficiency by bone meal feeding of the cows gives a superior crop of calves.

### Influence of Phosphorus Upon Food Consumption

Do cattle receiving bone meal eat more food in putting on the extra weight, or do they utilize their food better without actually eating more of it? The experimental data answers this question.

The cattle receiving bone meal eat more hay, increase more in weight and lose their osteophagia. For the first three months, the controls retain their osteophagia, gain only 30 lb. per head in weight and eat from 60 lb. to 80 lb. of hay per head per week, or about 10 lb. of hay per day in addition to the 2 lb. of flaked maize. The cattle receiving bone meal promptly lose their craving, eat 90 lb. to 100 lb. of hay per week, or about 4 lb. more per day, and gain 110 lb. per head in weight—practically four times as much as the controls receiving no bone meal.

Cattle on a phosphorus deficient diet do not utilize their food economically. Even if they eat a lot they waste it, and do not give a profitable return in live-weight for it. If the deficiency is rectified by bone meal feeding, they may eat more, but give a much better value in beef for all they eat.

### Conclusion

In all areas where soil and pasture are known to be deficient in phosphorus, it is profitable to feed bone meal to practically all stock for the sake of improving condition and facilitating rapid growth. For cattle it is particularly advisable since two important diseases—lamsiekte and styfsiekte—can be prevented by liberal bone meal feeding. When insurance against disease, increased beef production, increased milk yield, and more rapid growth of young cattle are all taken into consideration, it will be found that any expenditure on bone meal is repaid many times over.

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Enzootic hepatic cirrhosis of horses is the name of a fatal disease that occurs in the Pacific northwest. The cause of this malady has not been identified and unfortunately no treatment that is of value has been found.

The recent extensive outbreak of hog-cholera is difficult to comprehend on the basis of modern ideas concerning the spread of infection, in fact it makes one reflect on the Hippocrates theory of "Epidemic constitution."

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Some encouraging results have been obtained in the treatment of Hodgkin's disease with radium. It has also been suggested that similar results may be obtained by roentgen-ray irridation.

## HORSETAIL POISONOUS

Dr. George Lauder Stringham of Wappingers Falls, New York, writes as follows:

"I am sending you under separate cover a sample of weed taken from some hay. I would appreciate your opinion as to whether or not this weed is poisonous, and if so what symptoms and lesions might be expected."

The specimen sent proves to be common horsetail which is widely distributed in North America. It is a well known poisonous plant.

The effects of poisoning from horsetail appear at times varying from two to five weeks, depending on the age of the animal and the amount of material injected. The dried plant is more poisonous than the green plant, and young horses are more susceptible than older. The symptoms are these: general weakness and emaciation. There is a muscular weakness which becomes more pronounced at a later stage of the disease. The pulse and temperature are depressed, in the final stages the animal manifests nervous excitement. Cathartics should be administered and heart stimulants should be given.

L. H. Pammel.

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## EICHHORN REPORTS ON EUROPEAN VETERINARY CONDITIONS

At meeting of the Veterinary Medical Association of New York City, held in the Academy of Medicine, November 3, Dr. A. Eichhorn told of his recent visit to European countries, dwelling mostly on Portugal and Spain. He reported that veterinary organizations in these countries are similar to those in other European countries.

Requirements for admission to veterinary college being high school education. The college course is five years. Many of the instructors in these institutions are in general practice, as was the case in our country durthe early history of veterinary medicine.

Doctor Eichhorn stated that the donkey is the most used beast of burden in Spain and Portugal. Let it be harvesting or moving the household furniture this poor little fellow's back must be the Atlas.

The hog industry is an important one, not only for the value of swine in the food supply, but the fact that they may be raised and fattened at very little expense. The custom is to allow them to roam in the fields until they are about half the size of a hog cared for under the American system. Then they are driven into a forest to fatten on nuts, and the Doctor states that it is really marvelous how these pigs improve in size and weight in three or four months.

Vaccination for Hog Cholera has been put into practice of late.

Draft horses are seldom seen.

Race horses are numerous among the royalty and the wealthy.

Dairying is still very primitive. Goats are the principal source of milk supply. The production of clean safe raw milk is sadly neglected in most European countries. In the Scandinavian countries they carry on an inspection with particular reference to udder tuberculosis. The result of this indifference to milk inspection has raised infantile mortality materially, in fact, it is appalling. All of which makes plainer than ever the importance of this work as it is carried on in the United States, and of course in which veterinarians are taking such an active part.

Meat inspection is very lax as meat is scarce and high. Much "emergency slaughter" is permitted and sickness and death from meat poisoning is seen on every side.

The archaic methods of agriculture are almost beyond belief. They still thresh their grain by having oxen and donkeys walk on it and screen it by tossing it in the air.

Great parks are still watered by men with a sprinkling can. This is done for two reasons. One is that man power is so cheap, and the other is to give work to those who want it and so avoid pauperism.

The Doctor also visited France, and at the Affort Veterinary College he was told much about the experiments on foot and mouth disease that the American Commission has been carrying on there during the past year.

In France, as is the case in all the European countries excepting Jugo-Slavia, there are too many veterinarians for present conditions. Aside from the lack of ani-

mals and wealth, many Army veterinarians and Government veterinarians have been forced into private practice.

Small animal practice is growing rapidly and the colleges are giving more attention to it, as of course is the case everywhere, United States included.

Europe is now looking to America for leadership in sciences and arts. Our economic resources are much greater, this coupled with our isolation make the control of animal diseases much simpler than in European countries.

Goshen, N. Y. J. F. DeVine.

## NECROTIC ENTERITIS A CONTRAINDICATION OF USE OF VIRUS

In the October issue of Veterinary Medicine, Dr. Kinsley puts the following problem up to readers:

"On June 24th, 131 spring pigs that were kept in a sweet clover pasture were treated with serum and virus. There were 133 pigs in this lot but two runts were destroyed prior to vaccination. All pigs were coughing more or less when vaccinated.

"The owner reported seven dead pigs on June 30th, that is, six days after vaccination and the following conditions were reported July 7th, by the attending veterinarian. Several pigs were coughing, thumping, sneezing, also evidenced conjunctivitis and had a temperature up to 106.7° F. Three pigs were destroyed and carefully autopsied with the following findings: slight hemorrhages of the epiglottis, heart, lung and one punctiform hemorrhage in each kidney. Extensive congestion in anterior lobe of lung. Slight infestation with lung worms and ascarids. Spleen slightly enlarged and friable. Large "button" ulcer at ileo-cecal valve, and several small ulcers in mucosa of large intestine.

"Of the 131 that were vaccinated, fourteen have died, including three destroyed for autopsy. These pigs were taken off the sweet clover pasture when they began to sicken and have been receiving a ration of buttermilk from a nearby creamery and a small quantity of corn.

"The same serial serum and virus were used on other swine with splendid results. Is this a cholera break, or were the lesions found due to vaccination? How long standing was the enteritis in the pigs autopsied as reported above? What is the significance of the conjunctivitis? Did the sweet clover have anything to do with this outbreak? How should herds showing the above symptoms and lesions be treated?

"The above is like many others that are received from time to time and the readers of Veterinary Medicine will appreciate a discussion from practitioners in different sections of the country."

I would say the 133 pigs had everything but cholera before they were vaccinated. Necrotic enteritis caused old ulcers of long standing, various kinds of worms, plus lots of malnutrition. I think the owner was very fortunate he did not lose more pigs than he did at that time. Pigs having necrotic enteritis don't stand the double treatment well. I think they ought to be cleaned up first, fed up, before being given double treated and if necessary, given serum alone and later serum and virus. I do that way sometimes in bad looking herds and believe it pays.

Malta, Ill. C. M. Lunn.

## POISON HEMLOCK

Poison Hemlock has been found in several places in this state. This is known as a very poisonous plant containing an alkaloid conine. It is astonishing how ignorant people are with reference to poisonous plants. This is extensively naturalized in California, Salt Lake Basin and more or less common in the East, and I know of a considerable quantity in the vicinity of Bellevue, Iowa. It was interesting to note that this plant has also been found in several other places in the state of Iowa. The following may, therefore, be of interest. This is taken from the Press Dispatch and will be of interest to Veterinarians of Iowa.

"The poison hemlock, the same plant which was responsible for the death of Socrates, famous Greek philosopher, seems to be spreading in Iowa, according to reports received at Iowa State College.

A specimen was recently received from Mrs. Fred B. Tucker, of Ottumwa and it is found in several other places in the state. A considerable quantity of it is found near Bellevue.

The poison hemlock, Dr. L. H. Pammel, head of the Botany department, says, is very poisonous and its spread should be checked at once. It is a biennial with spotted stems and large compound leaves with small leaflets and white flowers. It is easily killed by cultivation.

Because of his teachings the Athenians accused Socrates of impiety, religious innovation and corrupting the youth of the city and he was condemned to die. The sentence was carried out by drinking poison hemlock."

## COW AND DAUGHTER SUFFER FROM LEUKEMIA

I am dealing with a 6 yr. old grade Jersey cow. About 6 weeks ago one of her eyes began bulging out but was not much inflamed. She began going down in flesh and about 4 weeks later the other eye did the same thing. I was called and I found all the palpable lymph glands were enlarged, from a slight-enlargement to as large as a good sized cocoanut. The man has about 25 head of good registered Jerseys and I suggested a tuberculin test. No positive reactions were found. The cow eats well and about a week ago, delivered a healthy looking calf. This cow's daughter and a calf of hers both died of a similar trouble. Her temperature runs around 102° F. and she has a dry scabby breaking out of the skin more or less all over the body. Her eyes do not appear very much inflamed but are bulged as though they would pop out of her head. They are not white or cloudy and she can see. Her pulse is about normal except a little fast.

If you can help me on a diagnosis or suggest anything, I will appreciate it.—P. T. F., Illinois.

Reply: It is very probable that the cow is affected with lymphatic leukemia. This, as you know, is a malady in which there is an extensive hyperplasia of lymphoid tissue throughout the body and associated with the enlarged lymphatic glands there is a marked increase of lymphocytes in the blood stream. Because of the disturbed balance of the lymphocytes in the blood stream, malnutrition ensues and such animals usually become emaciated and ultimately die of exhaustion. Thus far, treatment has been of no avail.

It might be advisable to apply symptomatic treatment but not with the intention of producing permanent results.

The condition is not regarded as a heritable one.—A. T. K.

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The use of a serum for the treatment of cancer has been given publicity recently. The available facts do not justify the conclusion that cancer is either contagious or infectious and the value of a biologic as a curative agent is problematic.

## VETERINARY OFFICER WINS "CHIEF OF CAVALRY HANDICAP"

Before a record crowd, with Major Herbert B. Crosby, chief of cavalry, and Brig. General E. B. Winans, occupying a box in the grandstand, Captain R. Payne McComb, Veterinary Corps, U. S. Army, rode Easter Day, a favorite to victory at the Juarez track in the "Chief of Cavalry Handicap."

The grandstand was literally jammed, every seat being occupied while hundreds stood in the aisles and upon the steps as other thousands congregated in front of the stands to watch the finish of each race.

All of the horses in the "Chief of Cavalry Handicap" were owned and ridden by officers in full uniform. Easter Day, the victor, was owned, trained, and ridden by Captain McComb. Poacher, which took second place, was ridden by Colonel E. A. Keyes, while Lava, owned by Major S. M. Wamsley and ridden by Lieut. Bowman, came in third.

Captain McComb gave his mount a wonderful ride, after getting him away to a forward start.—*The El Paso Times.*

TEXAS AGRICULTURAL COLLEGE LIBRARY JAN 27 '27



# Losses of Pigs Due to Ascaris Infestation

By A. T. KINSLEY

THE loss of pigs on American farms due to ascarid infestation is not fully realized. There are many parasites that infest swine both externally and internally but the round worms (ascarids) are of the greatest economic importance to the swine industry in the corn belt states. Many swine breeders have lost 50 per cent of their pig crop, and instances have been recorded where 80 to 90 per cent of the pigs farrowed on certain farms have died as a result of infestation of the lung with larval ascarids. The losses of swine due to round worms consists in the loss by death of probably not less than five per cent of the entire pig crop and a further loss due to diminished vitality, underdevelopment and shrinkage in thousands of slightly infested swine. It is probable that the annual loss due to these parasites is at least seven per cent of the value of all swine in the country and if it were possible to represent this annual loss in dollars, the sum would be appalling.

## Life Cycle of the Round Worm

The adult ascarid is usually found in the intestine, although it may be found in the stomach or in the bile duct. The adult worm is white or pinkish-white in color, pointed at both ends and varies from 6 to 12 inches in length. The eggs produced by the adult female are admixed with the content of the bowel and are discharged with the feces. After the eggs are eliminated from the intestine they develop embryos providing the temperature of their surroundings is between 60° F. and 90° F. and there is ample moisture. The eggs will not develop at a temperature of 100° F. or more nor if there is a lack of moisture. A manure pile is one of the most favorable places for these eggs to pass through the stage in which the embryo is developed.

When the egg containing embryo or parasite in the second stage is ingested by the pig the capsule is dissolved probably by the digestive fluids in the stomach of the pig and the parasite is thus liberated. The embryos have the ability to pass directly through the tissues of the infested pig, but only those parasites that ultimately reach the lung develop into the larvae or third stage of the parasite. By feeding embryos to non infested pigs, it has been demonstrated that they may reach the lung in four or five days after ingestion. In due time the larva development in the lung is completed after which the parasite passes into the air tubes and may be discharged from the body via the nose or pass down the esophagus to the stomach. Those eliminated from the body in the nasal secretion die, but those passing down the digestive tube develop to maturity within the intestine and produce eggs; thus the cycle is completed and begins anew to be so continued.

These parasites multiply very rapidly especially when climatic conditions are favorable and unless preventive measures are resorted to they become a serious menace to swine production on the infested premises.

## Symptoms

From the foregoing it will have been noted that these parasites pass a portion of their life in the lung and a portion in the digestive tube. Contrary to the general conceived idea, the lung disturbance created by these parasites is of far more importance than the disturbances in digestive organs. The lung form of the disease is practically confined to young pigs.

Pulmonary ascaridiasis is manifested by thumping, coughing, nasal discharge, impaired appetite and unthriftiness. These symptoms develop rapidly in recently farrowed pigs and if the infestation has been extensive the pig usually dies within four to seven days after the first symptoms are manifested. Symptoms evidenced in pigs

that are at least six weeks of age are less intensive, and the majority of animals infested at this age recover although they will show loss of condition and do not develop properly.

The symptoms resulting from infestation of the digestive tube with adults rarely occur in pigs less than one month of age. The symptoms manifested will vary according to the extent of infestation. A limited infestation usually produces a mild disturbance of digestion and is probably rarely observed. Intense or extensive infestation may be evidenced by restlessness, colicky pains and general distress. In some instances the parasites may entirely occlude the lumen of the bowels and result in death. Jaundice may be due to one or more of the round worms occluding the bile duct, thus preventing the elimination of bile. Regardless of whether there is a single adult round worm in a hog and no symptoms evidenced or there are many and the infested hog is noticeably ailing, methods should be resorted to and persisted in to eliminate these parasites and thus protect the future pig crop.

### Lesions

The successive lesions resulting from invasion of the lung with larval ascarids are: hemorrhages of variable size, serous infiltration or edema of the pulmonary tissue, and embolic pneumonia with or without abscess formation. Larval ascarids may be demonstrated by a microscopic examination of scrapings from the bronchial mucosa and from the embolic pneumonic lesions.

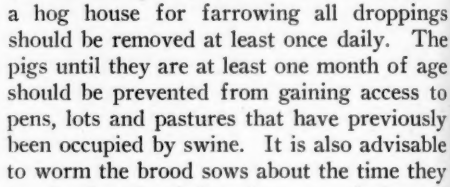
The lesions in the digestive tube produced by the adult parasite consist of a catarrhal inflammation resulting from mechanical injury induced by attachment of the parasite to the mucosa and by the chemic irritant liberated by the parasite. The areas of mechanical injury are prone to become infected with various microbes which may produce inflammation of varying intensity with or without necrosis and ulceration. Similar lesions may be observed in the hepatic duct when it is infested. In some instances the hepatic duct becomes occluded with these parasites resulting in a general icterus. Balls or masses of the parasites may obstruct the intestine. Occasionally the intestine may be perforated and the offending ascarids found protruding into the peritoneal cavity. There may be peritonitis resulting from the protruded parasite, and escaped intestinal content.

### Prevention

Ascaridiasis is a condition resulting from insanitary surroundings. This condition can be prevented by cleaning brood sows by thoroughly scrubbing about ten days before farrowing and placing them in farrowing pens that have been thoroughly cleaned of all debris and scrubbing with a solution of lye in hot water. Better results are usually obtained by placing the sow on virgin soil for farrowing. When sows are confined in a hog house for farrowing all droppings should be removed at least once daily. The pigs until they are at least one month of age should be prevented from gaining access to pens, lots and pastures that have previously been occupied by swine. It is also advisable to worm the brood sows about the time they are bred and confine them on virgin soil until the cleaning process ten days before farrowing time. By executing these precautionary measures losses from ascarid infestation will be reduced to a minimum.

### Treatment

Treatment of pigs affected with pulmonary ascaridiasis is of little value excepting the possibility of facilitating the elimination of the larval parasites and the muco-purulent



**Chronic Suppurative Otitis Media.**

exudate from the bronchial tubes and bronchioles by inhalation of vapors medicated with oil of eucalyptus or other similar agent. This form of treatment has been successfully used in a few pure-bred pigs in which the expense of treatment was justifiable.

The elimination of the adult ascarid from the intestine can be accomplished by the use of various vermifuges providing the swine are properly prepared for the medication and are given proper after treatment. The use of vermifuges in herd units is not satisfactory. Swine should be treated individually. Vermifuges are given in the form of capsules, tablets or fluid. Care should be exercised in medicating swine in order that the medicament is not deposited in the pharyngeal cul-de-sac. Fluid medicaments may be safely administered by a dose syringe or stomach tube.

The proper preparation of swine for vermifuge medication consists of withholding all feed and water for at least twelve hours. It is advisable to follow the administration of most vermifuges with a purgative. It is also advisable to maintain swine that have been given a vermifuge in a small, dry lot until the parasites have been eliminated in order that they can be gathered and destroyed for the females will contain thousands of viable eggs.

In summarizing it may be said that ascaridiasis is exacting a heavy toll from swine producers. The condition is due to insanitary surroundings. The loss occasioned by this disease is a needless waste and can be prevented by rotation of lots, worming sows at breeding time, cleaning sows about ten days before farrowing, and keeping the pigs out of infested pens, lots and pastures until they are at least one month of age.

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The indications are that there will be a shortage of swine in 1927, because thousands of sows that were being kept for breeding purposes were marketed because of the widespread outbreak of hog cholera.

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Loin disease and osteomalacia can be prevented in cattle on the coastal plains of Texas by feeding bone meal in salt. About three ounces of bone meal should be provided daily for mature cattle. This allowance of bone meal increases the growth of cattle and when fed to cows, better calves are produced.

## SOME POINTS IN DIFFERENTIAL DIAGNOSIS OF SWINE DISEASES

### Hog Cholera

Usually only a small percentage of the herd is affected in the beginning of an outbreak; a high temperature, no appetite and a tendency to hide in bedding are symptoms indicating hog cholera.

### Flu

High temperature, inappetence, tendency to remain in bedding, thumping, coughing and a large portion of the herd simultaneously affected are the usual symptoms of influenza.

### Necrotic Enteritis

Appetite fair to good, diarrhea, unthriftiness, emaciation and temperature 104-105° F, are the usual indications of infectious necrotic enteritis.

### Hemorrhagic Septicemia

Cough, discharge from eyes and nose, thumping, appetite fair and temperature up to 105° F, typifies the pulmonary form of hemorrhagic septicemia.

### Swine Erysipelas

Diminished appetite, dullness, temperature 104 to 106°; may or may not show locomotory disturbance; sloughing of tail or portion of ears.

A. T. Kinsley.

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Profitable swine production is dependent upon a rapid properly porportioned development by so feeding that the pig will continuously gain in weight from the time that it is ten days of age until mature and the feed provided should be sufficiently bulky in early life to develop the digestive organs.

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Sweet clover poisoning in cattle induced by feeding mouldy clover hay has been reported from many localities. This malady is characterized by a loss of the coaguability of the blood, the affected animals bleeding to death, within or without the tissues.

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Angora goat breeders are reducing the loss due to kemp in mohair and by education are stimulating the consumption of goat flesh under the name of chevon.

# Poultry Raising and Poultry Practice a Valuable Adjunct to a General Veterinary Practice

By O. W. JOHNSON, D. V. M., Davenport, Wash.

UNTIL a few years ago, wheat farmers in this part of Washington considered poultry a somewhat necessary evil on the farm. Chickens were looked upon as scavengers around the barns and manure piles. During the summers no feed was required and the few eggs the hens laid were counted net profit. During winter time, the hens were kept at a total loss, for they never laid an egg during the long winter.

I was graduated from a veterinary college in 1919, and immediately located at this place and began the attempt to build up a practice. I had much spare time on my hands, and in 1920 I decided to enter the poultry business as a side-line and hobby. A big barn which had been built by my predecessor for a veterinary hospital with accommodation for ten horses, was converted into a double decked poultry house, after leaving enough space for two patients of the equine type. Figuring 2½ square feet for each hen, I had floor space for 500 White Leghorn hens, but I did not embark into poultry keeping on a scale that large for several years. I went slowly, feeling my way, learning the business from literature and experience. I also paid special attention to poultry experiments carried on by the state agricultural experiment stations.

As a result I have derived a small but much needed extra income; have converted much otherwise idle time into profitable and enjoyable activity; have improved my health, and in a general way added interest to life. Furthermore, I have become acquainted with chicken diseases from a practical standpoint, and learned the values of different feeds. The farmers in the vicinity soon learned that I was able to make chickens pay, which stimulated them to take more interest in their poultry, and to feed and house them in a more proper manner, and thus some at least were able to convert a loss into profit. They learned to come to me for advice about feeding, housing, and to diagnose and treat poultry diseases. This added to my prestige as well as to my income.

### Infectious Disease Not Destructive

Contrary to popular opinion, epiornitics among poultry on poultry farms, are less common than nutritional diseases, due to forced feeding for high egg production. When sanitary laws are observed there are very few infectious diseases to contend with in grown-up chickens. Baby chicks, however, are very susceptible to infectious white diarrhea, leg weakness, and parasitic diseases such as coccidiosis and intestinal worms. But even with baby chicks, faulty feeding, housing and heating methods are the causes of by far the biggest losses. Millions of dollars are lost every year in the United States from improper care of baby chicks. If a poultry raiser is not on the watch every hour of the day and part of the night, while the baby chicks are being brooded, his whole year's profit may easily be swallowed up in a few days time.

Grown-up laying hens have an average annual mortality of about 15% on poultry farms. In most autopsies I have performed, the cause of death could be directly or indirectly traced to forced feeding for high egg production. The leading causes of death are the following pathological conditions in order named: intestinal inflammations, ovarian troubles, and hepatitis. Roup is quite common if the ventilation system is at

fault, or hens are crowded on the roosts. Tuberculosis is not common in poultry farm flocks for the reason that more sanitary measures are enforced on poultry farms and that the stock is usually renewed every year or every other year. Tuberculosis on the other hand is quite common in farm flocks. Usually the farmer brings in a history that his birds gradually fall off in flesh and some go lame. As a rule I can tell him the rest of the story, that nearly all hens affected are old hens, that their appetites remain good, that they continue to lay eggs until they are run down, and that if a postmortem examination is held he will find white spots in the liver and abscesses on the intestines.

Quite often I have been able to diagnose deficiency diseases from a knowledge of feeding methods. In a country where wheat and wheat products constitute almost hundred per cent of the ration of farm hens, there are quite often cases of leg paralysis in both young and old hens. Postmortem examination will show no gross pathological lesions, or perhaps only an abnormal brittleness of bones. One must conclude here that the feeding system is wrong. This disease can be prevented and often cured by adding other grains besides wheat to the ration, and by properly balancing the ration in proportion to protein and fats.

One must take into consideration that hens may get an abundance of vegetable protein in wheat bran, but that animal protein also, in the form of meat or milk is needed for hens. It is also necessary to advise feeding of some form of green food, even if the hens have free range, for if they have to go too far for it, they prefer to go without. One must serve it as a dessert, the last thing at night. Minerals in the form of crushed bones, oyster shells and fine bone meal must also be fed. Growing stock do not eat enough crushed bones and shells when fed in separate hoppers so that it is necessary to add fine bones to the dry mash for them.

Green feed and sunlight is necessary in storing up minerals in the system, both for egg production and bone development. Without it, there may be leg weaknesses in baby chicks, and fewer and thin shelled eggs in laying hens. Just whether it is the lack of sunshine or insufficient amount of greens which causes a decreased production during January and February, I will this year attempt to determine, by adding cod-liver oil (canned sunshine) to the ration during the winter months. I have seen mild winters, when the temperature was seldom below freezing, and yet there was a gradual lowered production from middle of December to middle of February. For early spring, lawn grass is most available, until middle of the summer when the kale is sufficiently grown to commence feeding. During late fall and early winter it is necessary to put the kale by a warm stove and thaw it before feeding, for any kind of frozen feed will surely ruin the egg production. After the kale supply runs out, alfalfa leaves is the next choice, if one can get the hens to eat them.

As far as drug treatment goes for infectious diseases, other than parasites, I have very little faith. Sometimes, however, it is necessary to give some harmless drugs in order to satisfy the farmer, and at the same time recommend such feeding and sanitary measures as will produce the desired results. Potassium permanganate, enough to color the drinking water, may do some good in keeping the water unpolluted, and goes a long way in satisfying the farmer.

Infectious white diarrhea, as we know, is a germ disease transmitted by the egg from the parent stock. It affects baby chicks when a few days old. The mortality is high. To prevent and cure it sour clabbered milk is a much lauded treatment, but by no means a sure cure. Bismuth subnitrate, theoretically, at least, might do some good in protecting the mucous membranes of the intestines, and I intend to give it a trial next spring. Prevention is the best cure here as in most other poultry diseases. No chicks should be hatched except from tested parent stock.

Coccidiosis is a parasitic infection and is very apt to occur among young chicks which are allowed to run over the same ground

year after year. It is characterized by bloody diarrhea and high mortality. On postmortem examination the intestines are found filled with blood, especially the cecae, or the latter may contain a cheesy mass. If in doubt, make a microscopic examination. For treatment change ground if possible. If not practicable, plow the ground, disinfect brooder house, kill all sickly birds and burn them, and feed the remainder semi-sour buttermilk or powdered buttermilk as recommended by Professor Beach.

Like coccidiosis, intestinal round worms and tape worms affect mostly young stock running on infested ground. The large round worms favor a place just about 8 inches back of the gizzard. The small round worms select the cecae. When present in large numbers they stunt the birds and decrease egg production in laying hens. When treating laying hens for worms, be careful, not give too large doses for the drugs may cause a false molt, which is a serious thing during the period of high priced eggs. Better go slow and give several small doses. Yard rotation is the only preventative for any kind of parasitic disease. No matter how limited the run, divide it up into three yards and give each yard two years rest, during which time it should be cultivated. A small area around the brooder house should be concreted if possible, so that the hose can be turned on and given a thorough scrubbing with hot water and lye at frequent intervals.

For lice there is nothing better than sodium fluoride applied by the pinch method. It is a slow and tedious job to treat several hundred birds, and one must wear a mask to prevent irritation to the nasal mucous membrane. When hens have access to dust baths, little attention need be paid to lice. The large vent louse according to my personal opinion does little damage.

It is different with mites during the hot summer months. Many times during July and August I have noticed a decrease in egg production far below what the average ought to be. Investigation would reveal mites by the billions in the nests. Now I never let them get such a good start. For cheapness and effectiveness there is no better treatment than discarded crank case oil. It is best applied with a brush for it clogs up any kind of spray pump. Clean the nests and then pour the oil in them, and be sure to cover all wood work in connection with the nests. Also don't forget to go over the roosts at least once every week during the hot months. In cooler weather the mites do not multiply so rapidly, and it is dangerous to apply the oil as it may throw the hens into a molt.

Every poultry man has a pet feeding system, and it must be said that any system which produces results in the long run without breaking down the constitution of the birds is a good system. We in the wheat belt naturally find wheat and wheat products the cheapest feed, and go as heavy on it as we dare, while the farmers in the corn belt can make a cheaper ration consisting principally of corn. Many prepared mashes are sold in the market, and for the person who keeps only a few chickens this is by far the most convenient way. However, I have this year bought nearly $1,200 worth of feed, and I figure that I have saved about $10.00 a ton by mixing my own feed.

A dry mash formula with which I have had fairly good results consists of the following:

| | | |
|---|---|---|
| Bran and shorts | 2 sacks | 160 lbs. |
| Low grade flour | 1 sack | 100 lbs. |
| Fine yellow corn | 1 sack | 80 lbs. |
| Meat meal, 60% | ½ sack | 150 lbs. |
| Bone meal | ¼ sack | 25 lbs. |

This makes a mash of about one of meat meal to seven of grain products, and when an equal amount of scratch grain is fed it makes the animal protein about one to fourteen of grain products, and a nutritive ration of 1 to 3. This is going heavy on the protein especially as the dry mash, which is fed once a day in wet form, is moistened with milk. However, during low priced egg seasons, one can decrease the amount of meat scraps, and thus make a cheaper mash.

For scratch grain I use 2 parts of wheat to 1 part of whole yellow corn. Yellow corn is preferable to white corn as it is richer in vitamines.

Sproated oats if fed once daily. No high

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priced oat sproater is necessary for this. A long trough can be fixed up in the cellar. The oats are first soaked from 12 to 24 hours, put in the trough and stired once daily in warm weather, less often in cold weather. It will sproat in from two to five days, depending on the temperature of the cellar. At Washington State College no sproated oats is fed, but some oats is added to the scratch grain.

The use of artificial light is certainly a great aid in getting a high production during the short days of fall and winter and when eggs are high priced. Some experts criticize the use of artificial lights on the ground that it reduces the hatchability of eggs and should therefore not be used on breeding hens. I start the old hens on electric lights about the middle of August and keep it up until they go into molt about Christmas time. By that method I prevent an early molt in at least 60% of the hens and get a high production of large standard eggs when they are worth up to 60 cents a dozen. During January and February when natural conditions make it difficult to obtain eggs, and they are worth only about 25 cents a dozen, is a good time to have them molting. On the other hand if I wish to dispose of them, I fatten them during January and get top prices in February.

The pullets are also started on light when 4½ months of age. This helps to start them in early production. After all artificial light is only a way of imitating nature, and if we can fool the chickens into believing that it is spring time in November and December, and get eggs accordingly, why not do it. Too much light, however, may overtax them, and may cause a false molt, especially if discontinued too suddenly during spring.

Whether or not it pays to keep the hen more than one year the individual must decide for himself and be governed by the success he has in raising the young stock. If one is very successful in raising the baby chicks and has facilities for raising enough to replace his entire flock each year, this is probably the best for him to do. On the contrary, if the cost of replacing the old stock every year comes too high, it is cheaper to keep the hens from one to three years if they are good producers. We do not dispose of a good dairy cow, just because she goes dry for a spell before freshening.

In culling I think much sin has been committed by county agents and others with half baked knowledge of poultry. On the other hand they have done some good in stimulating a desire for better poultry. There is no hundred per cent sure method of culling except by first trapnesting for an entire year to find the good and poor layers. It is not always the hen's fault that she stops laying during a certain time of the year, and to cull at this time would not be justice to the hen. The pigmentation test is perhaps next to trapnesting the best method to find the poor hens near the end of the laying season. Yellow skinned breeds, like the Leghorns, should near the end of the laying season have exhausted all the yellow pigments in their shanks and beaks, and if these are still yellow at this time it proves that the hen has not been laying heavily during the past year, probably not enough to pay for her feed. Such a hen should not be kept over the second year.

## PECULIAR SLOUGHING IN SWINE

Information relative to the following described condition in hogs will be appreciated. The hogs in question are following cattle that are being fed mouldy oat bundles. One young steer died of shipping fever (hemorrhagic septicemia) about one week before the first hog showed symptoms and the carcass was partly cremated, the hogs being permitted to consume the remainder of the carcass.

Several hogs were affected when the investigation was made, the symptoms noted were as follows: Swollen sensitive ears and in each case, there was a denuded area about one inch in diameter at the base of each affected ear. Within a few days, after the ears became swollen, the superficial tissue of the entire side of the head including a portion and in some cases the entire ear sloughs. In most cases there was a purulent discharge from the eyes in the begin-

ning and later there was marked swelling of the eye lids. The sloughs and denuded areas had an offensive odor. Most of the affected hogs continued to eat and none of them had a temperature above 104° F.—L. W., Iowa.

Suggestions on diagnosis and treatment by Veterinary Medicine readers will be appreciated.

## RABIES IN KENTUCKY

In one week in December, 15 families in Louisville, Kentucky, were registered with health department as having one or more members taking the Pasteur treatment for the prevention of rabies, feared as the result of the bites of rabid dogs.

This is the second serious outbreak of rabies in Louisville within a year. Dr. A. T. McCormick, secretary of the state

International News Reel Photo

**Dr. Henry M. Amling, New York, vaccinating a dog for the prevention of rabies. An effort is being made in New York to require such vaccination as a prerequisite for licensing**

board of health, attributes the Louisville situation to be due to three causes:

1. Dogs left unmuzzled by their owners.
2. Ownerless dogs which the city has neglected to kill.
3. Failure to immunize dogs with antirabies vaccine.

## HEIFERS COME IN HEAT AFTER SPAYING

I spay a number of heifers every spring and while I have not heard of any of them having calved afterward, there are some in almost every bunch that come in heat regularly after the operation.

Old time cow men tell me if I will take off the horns of the uterus, just back of the bifurcation that they won't come in heat.

As I operate with the heifer on the ground, inserting only two fingers, it is sometimes difficult to pull the horns far enough through the incision to reach the bifurcation.

It looks to me if I remove all of the ovary, it should make no difference where the horns are incised. I am always careful to remove all of the ovarian tissue, but do not always get all of the horn right back to the uterus.

What is it I do or fail to do that causes these bullers in nearly every bunch that I spay?—L. W. M., Wis.

REPLY: Estrum depends upon an internal secretion of the ovary. Where no ovarian tissue is left there will be no "slips." It is not essential or advantageous to remove any part of the uterus in this operation. A very small portion of ovarian tissue, even a part of the capsule of the ovary, remaining in situ will regenerate sufficiently to set up periods of estrum.

## THE WORLD'S MOST PROLIFIC COW

Aaggie Segis Calamity No. 18349, who gave birth to quadruplet calves a little over a year ago, gave birth this morning to a pair of twins, a male and female. The quadruplet family are all alive, hail, hearty and vigorous, as fine a family of Holstein calves as you would wish to see. The present owner of these calves and cow is Mr. Malcolm, McGregor, Manitoba. At this date Aaggie has a family of six under 17 months of age.

Brandon, Man. Harry Ross.